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Romania's Second Biennial Report

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LIST OF ABBREVIATIONS

AAUs	assigned amount units
AD	Activity Data
ALPP	Supporting the establishment of Local Associations of Forest Owners
APPR	Developing the Association of Private Forest Owners
CAP	Common Agricultural Policy
CC	Combined Cycle with gas turbines
CERs	certified emission reductions temporary
CMP	The Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol
CO_2	Carbon Dioxide
COP	Conference of the Parties
CRF	Common Reporting Format
EC	European Commission
EEC	European Economic Community
EERP	European Economic Recovery Plan
EF_S	Emission Factors
EMAS	Stimulating the operation of energy service companies
ERT	Expert Review Team
ERTMS	European Railway Traffic Management System
ERUs	emission reduction units
ETS	Emission Trading Scheme
EU	European Union
EU-ETS	European Union-Emission Trading Scheme
EUROSTAT	Statistical Office of the European Communities
FAO	Food and Agriculture Organization
FMIMS	Establishing a national system on forestry monitoring and information management
ForsBIC	Forest Sector Business Information Center

G2G	Netherlands Government to Government project
GACC	Guide on adaptation to the climate change effects
GD	Governmental Decision
GHG	Greenhouse Gas
GPG	Good Practice Guidance
GT	Promoting high efficiency cogeneration
GTMP	General Transport Master Plan
HCFC	Fluorinated Gases
HFC_s	Hydro-fluorocarbons
HRB	gas turbines with a heat recovery boiler
ICAS	National Research and Development Institute in Forestry ”Marin Drăcea”
IPCC 1996	Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories -1996
IPCC GPG 2000	IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories - 2000
IPCC GPG 2003	IPCC Good Practice Guidance for Land Use, Land Use Change and Forestry -2003
IPCCGPG 2006	IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories - 2006
IPCC	Intergovernmental Panel on Climate Change
ISPE	Institute for Studies and Power Engineering
ITU	Intermodal transport units
KCA	Key Category Analysis
KP	Kyoto Protocol
lCERs	long-term certified emission reductions
LULUCF	Land Use, Land Use Change and Forestry
MECC	Ministry of Environment and Climate Change
MEWF	Ministry of Environment, Water and Forests
MO	Ministerial Order
MoEO	Ministry of Environment Order

MOP	Meeting of the Parties
N.A. ”Romanian Waters”	National Administration ”Romanian Waters”
NAPCC	National Action Plan for Climate Change
NAPEE	National Action Plan for Energy Efficiency
NCCC	National Commission on Climate Change
NDP	National Development Plan
NEPA	National Environmental Protection Agency
NFA	Supporting the National Forestry Authority – Romsilva
NGHGI	National Greenhouse Gas Inventory
NIA	National Inventory Arrangements
NIR	National Inventory Report
NIS	National Institute for Statistics
NRDP	National Rural Development Program
NS	National System for the estimation of anthropogenic emissions by sources and removals by skins of all greenhouse gases not controlled by the Montreal Protocol
NSCC	National Strategy on Climate Change
NSEE	National strategy on energy efficiency
NSSD	National Strategy for Sustainable Development
PFC_s	Per-fluorocarbons
PMU	Biodiversity Conservation Management Project Management Unit
PNAEE	National Action Plan on Energy Efficiency
PNGD	National plan on waste management
QA/QC	Quality Assurance/Quality Control
RENAR	Romanian Accreditation Association
RMUs	removal units
SF_6	Sulfur Hexafluoride
SIT	Strategy on Intermodal Transport
SME	Small and medium enterprises
SMEs	Supporting the emergence of small and medium enterprises
SNGD	The national strategy on waste management

tCERs	certified emission reductions
UNFCCC	United Nations Framework Convention on Climate Change
VOC	Volatile Organic Compound
WAM	Additional Measures Scenarios
WB	World Bank
WEM	With Measures Scenarios
WOM	Without Measures Scenarios
YR	Year
%	Percent

1 INTRODUCTION

The present document constitutes the textual part of the Second Biennial Report officially submitted by Romania as a Party in Annex I to the United Nations Framework Convention on Climate Change to the UNFCCC Secretariat.

In elaborating the Second Biennial Report, Romania applied the provisions in Decisions 2/CP. 17 Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention and 19/CP. 18 Common tabular format for "UNFCCC biennial reporting guidelines for developed country Parties".

According to the provisions in the above mentioned decisions, the Second Biennial Report comprises the Biennial Report Common Tabular Format tables and a textual description.

The Biennial Report Common Tabular Format tables have been elaborated using the BR CTF software administrated by the UNFCCC Secretariat.

2 INFORMATION ON GREENHOUSE GAS EMISSIONS AND TRENDS

2.1 Background information

2.1.1 Background information on GHG inventories and climate change and supplementary information required under Article 7, paragraph 1, of the Kyoto Protocol

2.1.1.1 Background information on climate change

In Romania, the climate variability will have direct effects on certain sectors such as agriculture, forestry, water management, residential and infrastructure will lead to changes in the vegetation cycle and to movement of the demarcation lines between forests and meadows, will determine the increase of the frequency and of the intensity of the extreme meteorological events (storms, floods, droughts). The changes in the Romanian climate regime are framed within the global context, considering the regional conditions: the temperature increase will be more pronounced during the summer, while in north-western Europe the most pronounced temperature increase is expected in winter.

In Romania it is expected an increase of the average annual temperature compared to the 1980-1990 similar to that specific to the whole Europe, with small differences between the models results in respect to the first decades of the XXI century, and with larger differences in respect to the end of the same century:

- between 0.5°C and 1.5°C, for 2020-2029;
- between 2.0°C and 5.0°C, for 2090-2099, depending on the scenario (e.g. between 2.0°C and 2.5°C for the scenario foreseeing the lowest increase of the average global temperature and between 4.0°C and 5.0°C in case of the scenario with the most pronounced temperature increase).

Considering the pluviometrical view, over than 90% of the climate models forecasts for 2090-2099 pronounced droughts during the summer in Romania, especially in south and south-east (with negative deviations compared to 1980-1990 larger than 20%). Taking into account the winter precipitations, the deviations are smaller while the uncertainty is larger.

Effects on agriculture

The agriculture represents the most vulnerable sector, the elaborated studies highlighting the following aspects:

- wheat crop - a production increase with approximately 0.4-0.7 t/ha and the decrease of the vegetation season by 16-27 days;
- non-irrigated maize crop – the grains production increase with approximately 1.4-5.6 t/ha, a decrease of the vegetation season ranging between 2-32 days, a decrease of the vegetation cycle ranging between 2-19%; the estimated values depend on the model used;
- irrigated maize crop - the results depend on the models used and on the conditions of the locations chosen for data sampling;
- for analyzing the effects on the main crops agricultural productivity, several agro-meteorological models were used.

Effects on silviculture

Out of the national area, approximately 27% represent the area covered by forests; the forests are unevenly spread on the country's territory (approximately 51.9% in the mountain area, 37.2% in the hilly area and 10.9% in the plain area). In 2013 year, the forest land area accounted for approximately 7 228,3 thousand ha; associated to that, an additional area was destined to forest crop, production and management. In the lower and hilly forested areas, a considerable drop of the forests productivity is foreseen after 2040, due to the increase of the temperatures and to the decrease of the precipitations volume.

Effects on the water management

The hydrological consequences of the increase of the CO_2 atmospheric concentration are significant. The modeling of the effects produced by this phenomenon was realized focusing on the main hydrographic basins. The modeling results show the probable effects of the changes in the precipitations volume and in the evapo-transpiration.

Effects on the human establishments

The industrial, commercial, residential and infrastructure sectors (including the supplying with energy and water, the transport and the waste disposal) are vulnerable to the climate change. The main impact of the climate change on urban areas, on infrastructure and on constructions is mainly linked to the effects of extreme meteorological events such as heat waves, pronounced snowfalls, storms, and floods, increase of the slopes instability and the modification of some geophysical properties. Thus, urban planning and designing of an appropriate infrastructure plays an important role in minimizing the impact of climate change and in reducing the risk on the anthropic environment.

2.1.1.2 Background information on greenhouse gas inventories

As a Party to the UNFCCC and its Kyoto Protocol, Romania is required to produce and regularly update the national GHG inventory. According to the COP decision regarding Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories (FCCC/CP/2013/10/Add. 3), Parties shall submit a National Inventory Report (NIR) containing detailed and complete information on their inventories, in order to ensure the transparency of the inventory. This is the 22nd complete submission of the National GHG Inventory of Romania. The structure of the National Inventory Report is in line with the provisions in the Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories (FCCC/CP/2013/10/Add. 3) and in the Annotated outline of the National Inventory Report including reporting elements under the Kyoto Protocol, document provided by the UNFCCC Secretariat.

The submission of 2015 inventory covers the obligation of Romania under the UNFCCC, following the issues on the functioning status of the CRF Reporter application.[1]

[1] According to Decision 13/CP.20 of the Conference of the Parties to the UNFCCC, CRF Reporter version 5.0.0 was not functioning in order to enable Annex I Parties to submit their CRF tables for the year 2015. In the same Decision, the Conference of the Parties reiterated that Annex I Parties in 2015 may submit their CRF tables after 15/April, but no longer than the corresponding delay in the CRF Reporter availability. "Functioning" software means that the data on the greenhouse emissions/removals are reported accurately both in terms of reporting format tables and XML format.

For the 2015 submission, Romania prepared the CRF tables and database containing emissions/ removals estimates and background data for 1989 - 2013 period and the National Inventory Report.

The greatest attention during the preparation was payed to the direct GHGs mentioned through Annex A of the Kyoto Protocol - CO_2, CH_4, N_2O, HFCs, PFCs, SF_6 and NF_3. In addition, the indirect GHGs (NO_X, CO, NMVOCs, and SO_2) were also taken into account.

The GHG inventories submitted annually by Parties are subject to reviews by Expert Review Teams coordinated by the UNFCCC Secretariat.

Up to now, the GHG inventories of Romania were reviewed under UNFCCC and Article 8 of the KP as presented in Table 2.1.

Table 2.1 Overview of the Romanian GHG Inventories review under Article 8 of the KP

Year	Submission	Review process
2002	CRF tables and draft NIR submitted (late submission)	No Review
2003	CRF tables and NIR submitted	In - country Review
2004	CRF tables and NIR submitted	Desk Review
2005	CRF Reporter database, CRFs for LULUCF and NIR submitted	Centralized Review
2007	2nd version of the 2006 submission: CRF Reporter database, CRF Tables and NIR + Initial Report of Romania under the Kyoto Protocol	In - country Review
2008	2007 and 2008 submissions: CRF Reporter database, CRF Tables and NIR	Centralized Review

CRF reporter version 5.10 still contained issues in the reporting format tables and XML format in relation to Kyoto Protocol requirements, and it was therefore not yet functioning to allow submission of all the information required under Kyoto Protocol.

Recalling the Conference of Parties invitation to submit as soon as practically possible, and considering that CRF reporter 5.10 allows sufficiently accurate reporting under the UNFCCC (even if minor inconsistencies may still exist in the reporting tables, as per the Release Note accompanying CRF Reporter 5.10), the National Inventory Report submitted in November 2015 is part of the official submission for the year 2015 under the UNFCCC. The report is not an official submission under the Kyoto Protocol, even though some of the information included may relate to the requirements under the Kyoto Protocol.

Year	Submission	Review process
2009	2009 submission: CRF Reporter database, CRF Tables and NIR	Centralized Review
2010	2010 submission: CRF Reporter database, CRF Tables and NIR	Centralized Review
2011	3rd version of the 2011 submission	In - country Review
2012	2nd version of the 2012 submission	Centralized Review
2013	1st version of the 2013 submission	Centralized Review
2014	1st version of the 2014 submission	Centralized Review

The reports on these reviews can be found on the UNFCCC website.

2.1.1.3 Background information on supplementary information required under Article 7, paragraph 1, of the Kyoto Protocol

The NIR officially submitted in November 2015 includes supplementary information required under Article 7, paragraph 1, of the Kyoto Protocol as follows:

- information on anthropogenic greenhouse gas emissions by sources and removals by sinks from LULUCF activities under KP's Article 3, paragraphs 3 and 4, in accordance with the provisions in Section I.D of the Annex to Decision 15-CMP. 1; the information is subject to the current functioning status of the CRF Reporter application;
- information on Kyoto units (emission reduction units (ERUs), certified emission reductions (CERs), temporary certified emission reductions (tCERs), long-term certified emission reductions (lCERs), assigned amount units (AAUs) and removal units (RMUs)), as set out in Section I.E of the Annex to Decision 15/CMP. 1;
- changes in national systems in accordance with Article 5, paragraph 1, of the Kyoto Protocol, as set out in Section I.F of the Annex to Decision 15/CMP. 1;
- changes in national registries as set out in Section I.G of the Annex to Decision 15/CMP. 1;

- ❖ minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol, as set out in Section I.H of the Annex to Decision 15/CMP. 1.

2.1.2 A description of the national inventory arrangements and national system

2.1.2.1 Institutional, legal and procedural arrangements and supplementary information required under Article 7, paragraph 1, of the Kyoto Protocol

The Governmental Decisions (GD) no. 120/2014 and 668/2012 for modifying and completing the GD no. 1570 for establishing the National System for the estimation of anthropogenic greenhouse gas emissions levels from sources and removals by sinks, adopted in 2007, and the subsequent relevant procedures, the GD no. 48/2013 on the organization and functioning of the Ministry of Environment and Climate Change and for modifying some environment protection and climate change domain related legal acts and the GD no. 38/2015 on the organization and functioning of the Ministry of Environment, Waters and Forests are regulating all the institutional, legal and procedural aspects for supporting the Romanian authorities to estimate the greenhouse gas emissions/removals levels, to report and to archive the National Greenhouse Gas Inventory (NGHGI) information, including supplementary information required under Article 7, paragraph 1, of the Kyoto Protocol. In this respect, the GD no. 48/2013 also modified the GD no. 1570/2007.

The National Inventory Arrangements (NIA) and the National System are based on the provisions in the Decision 24/CP. 19 on the Revision of the UNFCCC reporting guidelines on annual inventories for Parties included in Annex I to the Convention and on Article 5 of the Kyoto Protocol, and complies with the provisions of the subsequent decisions of the CMPs of the Kyoto Protocol, with the provisions of the Regulation (EU) no. 525/2013 of the European Parliament and of the Council on a mechanism for monitoring and reporting greenhouse gas emissions and for reporting other information at national and Union level relevant to climate change and repealing Decision no. 280/2004/EC and of the Commission Implementing Regulation (EU) no. 749/2014 on structure, format, submission processes and review of information reported by Member States pursuant to Regulation (EU) No 525/2013 of the European Parliament and of the Council.

The main objective of the Governmental Decision no. 1570/2007, as ulteriorly modified and completed, is to ensure the fulfillment of the relevant provisions and the obligations of Romania under the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol and the European Union legislation.

Starting with 1 April 2013, the competent authority, which is responsible for administrating the National Inventory Arrangements and National System, is the Ministry of Environment and Climate Change (MECC), presently, following the reorganization of the institution, the Ministry of Environment, Waters and Forests (MEWF). Anteriorly, the competent authority was the National Environmental Protection Agency (NEPA), under the subordination of the MECC.

Based on the GD no. 48/2013, all NEPA climate change related structure, personnel, attributions and responsibilities were took over by MECC, in order to improve the institutional arrangements and capacity within the climate change domain, thus increasing the efficiency in activities implementation also in respect to the NS/NGHGI administration.

National Inventory Arrangements are designed and operated:

- to ensure the transparency, consistency, comparability, completeness and accuracy of inventories;
- to ensure the quality of inventories through the planning , preparation and management of inventory activities.

The definition and characteristics of the Romanian National Inventory Arrangements and National system for the estimation of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol (NS) comprise:

- includes all institutional, legal and procedural arrangements made as a Party included in Annex I for estimating anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, and for reporting and archiving inventory information;
- represents a system for the collection, processing and adequate presentation of data and information for the elaboration of the NGHGI;
- is designed and operated to ensure the transparency, consistency, comparability, completeness and accuracy of inventories as defined in the guidelines for the preparation of inventories by Parties included in Annex I, in accordance with relevant decisions of the COP and/or COP/MOP;

- is designed and operated to ensure the quality of the NGHGI through planning, preparation and management of inventory activities;
- is designed and operated to support compliance with the Kyoto Protocol and with the European Union legislation commitments related to the estimation of anthropogenic GHG emissions by sources and removals by sink;
- is designed and operated to consistently estimate anthropogenic emissions by all sources and removals by all sinks of all GHGs, as covered by the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories and IPCC good practice guidance, in accordance with relevant decisions of the COP and/or COP/MOP.

The elements on the implementation of the NIA and NS general functions are described below:

A. Establish and maintain the institutional, legal and procedural arrangements necessary to perform the functions for national systems, as appropriate, between the government agencies and other entities responsible for the performance of all functions defined in these guidelines

Institutional arrangements

The elements characterizing the institutional arrangements comprise:

- according to the Governmental Decision no. 1570/2007 as ulteriorly modified and completed, the single national entity with overall responsibility for the national inventory, including with the responsibilities of administrating the NIA and NS and of preparation and management of the NGHGI, is the Ministry of Environment, Waters and Forests.

Before 1 April 2013, the competent authority was the National Environmental Protection Agency (NEPA), under the subordination of the MECC. Based on the GD no. 48/2013, all NEPA climate change related structure, personnel, attributions and responsibilities were took over by MECC, in order to improve the institutional arrangements and capacity within the climate change domain, thus increasing the efficiency in activities implementation also in respect to the NS/NGHGI administration.

- central and territorial public authorities, research and development institutes and other public organizations under the authority, in the subordination or in the coordination of central public authorities, owners and professional associations, economic operators and other relevant organizations have the obligation of providing to MEWF the necessary activity data, emission factors and associated uncertainty data;
- the main activity data supplier is the National Institute for Statistics through the yearly-published documents as the National Statistical Yearbook and the Energy Balance and other documents;
- the characteristics of the institutional arrangements include:
  - centralized approach – MEWF maintain a large degree of control and decision making authority over the inventory preparation process;
  - in-sourced approach, in majority – the major part of the inventory is prepared by MEWF (governmental agency);
  - single agency – the single national entity is housed within a single governmental organization;
  - separate approach – the NGHGI related work is not integrated with other air pollutant inventories work; however, cross checking activities are periodically implemented.
- the institutional arrangements currently used in Romania are presented in the Figure 2.1;
- in 2011, the NGHGI Land Use, Land-Use Change and Forestry (LULUCF) Sector, both under the UNFCCC and KP, was administrated by the Forest Research and Management Planning Institute (ICAS), based on a contract with Ministry of Environment and Forests, in the context of the study "NGHGI LULUCF both under the UNFCCC and KP obligations";
- in 2012-2014 period, the NGHGI LULUCF Sector, both under the UNFCCC and KP, is administrated by ICAS, based on the Protocol of collaboration no. 3029/MMP-RP/3.07.2012 between Ministry of Environment and Forests, NEPA and ICAS; ICAS also contributed by developing the studies:
  - in 2012, "Determination of emission/removal factors for the forest and for conversions from/to forest land associated pools both under UNFCCC and KP obligations" and "Compilation of the 2013 National Greenhouse Gas Inventory Land

Use, Land-Use Change and Forestry Sector both under the UNFCCC and KP obligations" based on contracts with Ministry of Environment and Forests;

- in 2013, "Determination of emission-removal factors for the pools in forest areas and in areas in conversion from and to forest according with the obligations assumed as a Party to the UNFCCC and to the KP, for the 2014 year reporting" and "Compilation of the National Greenhouse Gas Inventory Land Use, Land-Use Change and Forestry Sector for the 2014 year associated reporting, according with the obligations assumed as a Party to the UNFCCC and to the KP".

❖ on an undetermined period, the preparation of Road transport category estimates based on COPERT 4 model is administered also based on the Protocol of collaboration no. 3136/MMP/9.07.2012 between Ministry of Environment and Forests, NEPA, Romanian Automobile Register and Directorate on Driving Licenses and Vehicles Registration in the Ministry of Administration and Interior;

❖ development of country-specific values associated to several NGHGI sectors has been also supported by the Institute for Studies and Power Engineering (ISPE) through the development of the studies:

- in 2011, "Elaboration/documentation of national emission factors/other parameters relevant to NGHGI Sectors Energy, Industrial Processes, Agriculture and Waste, values to allow for the higher Tier calculation methods implementation";
- in 2013, "Determination of the biodegradable content industrial wastes amount and of sludge amount from wastewater treatment, deposited in managed landfills (for the period 1989-2012) and in unmanaged landfills (for the period 1950-2012). Determination of incinerated wastes type/amount and of parameters specific to their incineration, for the period 1989-2012. Wastes incineration N_2O emissions estimation";
- in 2014, "Elaboration and documentation of values for the parameters relevant to the National Greenhouse Gas Inventory Sector Industrial Processes and Product Use, values to allow for the implementation of the higher tier greenhouse gas emissions calculation methods for the categories Lime production, Glass production and Ammonia production, according to the IPCC 2006 methodology" and "Elaboration and documentation of values for the parameters relevant to the National Greenhouse

Gas Inventory Sector Industrial Processes and Product Use, values to allow for the implementation of the higher tier greenhouse gas emissions calculation methods for the category Iron and steel production, according to the IPCC 2006 methodology".

- based on the study "Elaboration and documentation of the parameters values relevant to the National Greenhouse Gas Inventory Industrial Processes Sector values to allow for the greenhouse gas emissions calculation methods, higher Tier methods, for the categories: Production of halocarbons and sulphur hexafluoride (HFCs, PFCs and SF_6), Consumption of halocarbons and sulphur hexafluoride (actual emissions), Consumption of halocarbons and sulphur hexafluoride (potential emissions)", Denkstatt improved the system of administrating the HFCs, PFCs and SF_6 data and information.
- the "Support for the implementation of the European Union requirements on the monitoring and reporting of the carbon dioxide (CO_2) and other greenhouse gas emissions" study was carried out in 2011 by the Institute for Studies and Power Engineering (ISPE); specific elements comprise:
  - package 1 activities – improving NS:
    - evaluation of NS and of the relevant technical assistance projects previously implemented;
    - establishing the measures necessary for improving the institutional capacity and structure for implementing the NS - the contractor identified the institutional, legal and procedural measures for assuring the compliance of the NGHGI with the applicable standards, including solutions for improving the sectorial databases;
    - elaboration of draft legal proposals for an efficient administration of the NGHGI. The GD no. 1570/2007 was updated accordingly;
    - general training session for improving the expertise of the personnel working in the climate change field, at the central administration and subsequent level.
  - package 2 activities – developing the institutional capacity for reporting the GHG emissions/removals:
    - evaluation of the Romanian capacity to report the GHG emissions according to the European Union requirements;
    - improving the reporting capacity of the authorities in Romania;

- specific training session for improving the expertise of NEPA team on the attributions/responsibilities of administrating the NS/NGHGI.

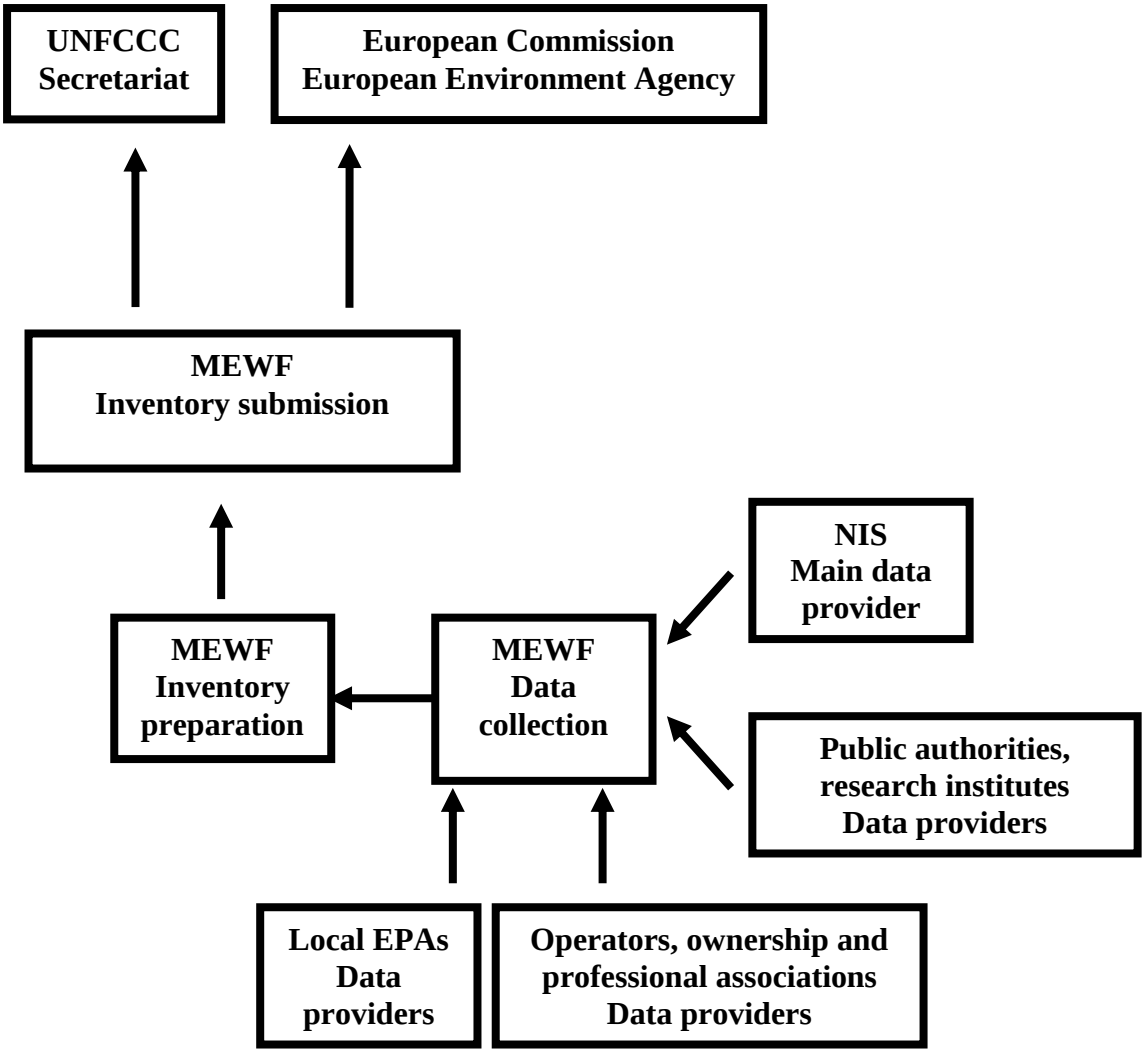
➢ package 3 activities-establishing the programs and measures necessary for determining the emission factors and other national relevant parameters.

❖ during 2011-january 2012, NEPA performed an analysis on improving the institutional and legal arrangements part of the NS;

❖ the results of previously two specified activities were corroborated and were also used for updating the GD no. 1570/2007;

❖ the Ministry of Environment, Waters and Forests officially considers, approves and submits the National GHGI to the UNFCCC Secretariat, the European Commission and the European Environment Agency taking into account the specific deadlines.

Figure 2.1 Current national inventory system description



Legal and procedural arrangements

The legal and procedural framework specific to the NIA and NS include:

- GD no. 120/2014 for modifying and completing the GD no. 1570/2007 for establishing the National System for the estimation of anthropogenic greenhouse gas emissions levels from sources and removals by sinks of all GHGs, regulated through the KP, and also for establishing some measures on implementing the Regulation (EU) no. 525/2013 of the European Parliament and of the Council on a mechanism for monitoring and reporting greenhouse gas emissions and for reporting other information at national and Union level

relevant to climate change and releasing Decision no. 280/2004/EC and the Commission Implementing Regulation (EU) no. 749/2014 on structure, format, submission processes and review of information reported by Member States pursuant to Regulation (EU) No 525/2013 of the European Parliament and of the Council;

- GD no. 48/2013 on the organization and functioning of the Ministry of Environment and Climate Change and for modifying some environment protection and climate change domain related legal acts; it modified also the GD no. 1570/2007;
- GD no. 48/2013 on the organization and functioning of the Ministry of Environment and Climate Change and for modifying some environment protection and climate change domain related legal acts; it modified also the GD no. 1570/2007;
- GD no. 38/2015 on the organization and functioning of the Ministry of Environment, Waters and Forests;
- GD no. 668/2012 for modifying and completing the GD no. 1570/2007 for establishing the National System for the estimation of anthropogenic greenhouse gas emissions levels from sources and removals of CO_2 by sinks, regulated through the KP;
- GD no. 1570/2007 for establishing the National System for the estimation of anthropogenic greenhouse gas emissions levels from sources and removals of CO_2 by sinks, regulated through the KP;
- Ministry of Environment Order (MoEO) no. 1376/2008 for approving the Procedure on NGHGI reporting and the modality for answering to the observations and questions raised following the NGHGI review;
- MoEO no. 1474/2008 for approving the Procedure on processing, archiving and storage of data specific to the NGHGI;
- MoEO no. 1442/2014 on approving the Procedure on selection of the estimation methods and of the emission factors needed for the estimation of the GHG levels;
- MoEO no. 1602/2014 on approving the Quality Assurance and Quality Control Plan associated to the National Greenhouse Gas Inventory;
- Protocol of collaboration no. 3136/MMP/9.07.2012 between Ministry of Environment and Forests, NEPA, Romanian Automobile Register and Directorate on Driving Licenses and Vehicles Registration in the Ministry of Administration and Interior, on the preparation of Road transport category estimates based on COPERT 4 model.

B. Ensure sufficient capacity for timely performance of the NIA and NS functions, including data collection for estimating anthropogenic GHG emissions by sources and removals by sinks and arrangements for technical competence of the staff involved in the inventory development process

Specific elements include:

- following the 2013 governmental decision on government restructuration and ulterior reorganizations, 12 posts are available in the National System for Estimating the GHG Emissions Unit–Climate Change General Directorate in the MEWF, exclusively for administrating the NIA and NS/NGHGI; the activity continued in an optimal manner, considering also that the attributions and responsibilities have been reallocated to existing personnel;
- following the governmental approval of taking over the NEPA climate change related structure, personnel, attributions and responsibilities, starting with 1 April 2013, 14 people (out of 16 available posts) in the National System for Estimating the GHG Emissions Unit–Climate Change General Directorate in the MECC had exclusively the responsibilities of administrating the NS/NGHGI.

Taking over the NEPA climate change related structure, personnel, attributions and responsibilities by MECC, was performed in order to improve the institutional arrangements and capacity within the climate change domain, thus increasing the efficiency in activities implementation also in respect to the NIA and NS/NGHGI administration.

Appropriate working space, facilities and necessary IT equipment were provided to the MECC personnel took over from NEPA.

- following the governmental approval of establishing a new unit at NEPA and as a result of finalization of the recruitment procedure (end of August 2011), 16 people in the National System for Estimating the GHG Emissions Unit–Climate Change and Sustainable Development Directorate had exclusively the responsibilities of administrating the NS/NGHGI (previously, 5 out of maximum 14 people in the Climate Change Unit–Climate Change, Sustainable Development Directorate of NEPA had the responsibilities of

administrating the NS/NGHGI while the Climate Change Unit covered also the administration of the European Union Emission Trading Scheme, of the National GHG Emissions Registry and of other climate change domain related issues);

- additionally to the elements presented at second point:
  - appropriate working space and facilities have been provided;
  - the necessary IT equipment has been procured through the support of study "Environmental Integrated Informational System";
  - training the dedicated staff was subject to the UNFCCC training courses and of the study performed in 2011 "Support for the implementation of the European Union requirements on the monitoring and reporting of the carbon dioxide (CO_2) and other greenhouse gas emissions"; additionally, the European Environment Agency (EEA) through the European Topic Centre for Air pollution and Climate change Mitigation provided both in 2011 and 2012 technical assistance to the NS/NGHGI dedicated team;
  - on contractual basis, the NEPA personnel administrating the NGHGI Energy Sector received in 2011 technical assistance from the Environment Agency of Austria, the results being incorporated in the NGHGI 2012;
  - training was based on the Schedule for training of new staff part of the NEPA team dedicated to the administration of the NS and the NGHGI, respectively (Table 1);
  - general training session for improving the expertise of the personnel working in the climate change field, at the central administration and subsequent level, including personnel from NGHGI data/information providers/potential providers, was held in 2011 in the context of the "Support for the implementation of the European Union requirements on the monitoring and reporting of the carbon dioxide (CO_2) and other greenhouse gas emissions" study;
  - training of NEPA team dedicated to the administration of the NS and the NGHGI and of other partners in the NS on key category analysis and uncertainty analysis related issues was also performed in 2012 by the Environment Agency of Austria and University of Graz consortium in the general framework of implementation of the study "Environmental Integrated Informational System" (by the SC Asesoft International SA-SC Team Net International SA-SC Star Storage SRL consortium);

additional training on the use of the key category analysis and, respectively, uncertainty analysis related software developed by the Environment Agency of Austria and University of Graz consortium, have been provided to NEPA team by the SC Asesoft International SA-SC Team Net International SA-SC Star Storage SRL consortium in 2013.

- based on the GD no. 1570/2007 as ulteriorly modified and completed, all entities/ organizations involved in implementing the NS functions are obliged to ensure sufficient capacity for timely performance of NS functions and arrangements for technical competence of the staff involved in the inventory development process.

Table 2.2 Schedule of training of new staff part of the NEPA team dedicated to the administration of the NS and NGHGI

No.	Activity	Period/ Deadline	Persons subject to training	Responsible persons	Documents to be considered
1.	Improving the technical knowledge based on international and national documents related to the National System for Estimating the Greenhouse Gas Emissions/Removals (NS) and the Greenhouse Gas Inventory (NGHGI)	1 September 2011 - 10 March 2012	All new Sectorial Experts (SEs)	GHG Inventory coordinator	Governmental Decision (GD) no. 1570/2007, Ministry of Environment Order (MoEO) no. 1376/2008 for approving the Procedure on NGHGI reporting and the modality for answering to the observations and questions raised following the NGHGI review; MoEO no. 1474/2008 for approving the Procedure on processing, archiving and storage of data specific to the NGHGI; NEPA's President Decision no. 23/2009 for approving the Procedure on selection of the estimation methods and of the emission factors needed for the estimation of the GHG levels; NEPA's President Decision no. 24/2009 for approving the QA/QC Procedure related to the NGHGI, National Inventory Report-Romanian version-NGHGI 2009, NGHGI 2011, 2010, 2009, Updated UNFCCC reporting guidelines on annual
2.	Training in the context of the study "Support for the implementation of the European Union requirements on the monitoring and reporting of the carbon dioxide (CO_2) and other greenhouse gas emissions"	31 October 2011	All new SEs	GHG Inventory coordinator	

No.	Activity	Period/ Deadline	Persons subject to training	Responsible persons	Documents to be considered
					inventories following incorporation of the provisions of decision 14/CP.11 (UNFCCC Reporting Guidelines), IPCC good practice guidance (IPCC GPG 2000), IPCC good practice guidance for LULUCF (IPCC GPG 2003), IPCC 1996
3.	On-line UNFCCC Secretariat and GHG Management Institute reviewer training courses	3 October - 31 December 2011	All new SEs	GHG Inventory coordinator	UNFCCC Secretariat and GHG Management Institute on-line training courses, IPCC GPG 2000, IPCC GPG 2003, IPCC 1996
4.	Training provided by the - European Environment Agency and European Topic Centre for Air pollution and Climate change Mitigation in respect to Energy, Industrial processes, Solvents and other product use and Waste NGHGI Sectors; - European Commission-Joint Research Centre, in respect to the Agriculture and Land	15 October - 31 December 2011	All new SEs	GHG Inventory coordinator	IPCC GPG 2000, IPCC GPG 2003, IPCC 1996

No.	Activity	Period/ Deadline	Persons subject to training	Responsible persons	Documents to be considered
	Use, Land-Use Change and Forestry (LULUCF) Sectors				
5.	Implementing together with the more senior staff, based on a sectorial approach, all activities pertaining to the NS and NGHGI administration, including the activities related to NGHGI preparation plan and NGHGI improvement plan	1 September 2011 - 10 May 2012	All new SEs	GHG Inventory coordinator, QA/QC coordinator, older SEs	All documents at point 1, as well as other relevant documents

C. Designate a single national entity with overall responsibility for the national inventory

According with the GD no. 1570/2007 as ulteriorly modified and completed, the single national entity with overall responsibility for the national inventory, including with the responsibility of administrating the NIA and NS, is MEWF.

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

Specific elements comprise:

- as a Party to the UNFCCC, KP and as a Member State of the European Union, Romania annually submits the GHGI;
- 2015 submission of the NGHGI constitutes the 22nd complete submission of the NGHGI of Romania;
- Romania submits the NGHGI within the relevant deadline: 15 January and 15 March, to the European Commission and to the European Environment Agency, and 15 April, to the UNFCCC Secretariat; in respect to the 2015 submission, the inventory is submitted considering also the current functioning status of the CRF Reporter;
- the NGHGI is prepared in accordance with Article 5 and Article 7, paragraphs 1 and 2, of the KP, and with relevant decisions of the COP and/or COP/MOP. Beginning with 2010, Romania reports supplementary information required under Article 7, paragraph 1, of the KP within the NGHGI.

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

Romania report 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. Beginning with 2010, Romania reports supplementary information required under Article 7, paragraph 1, of the KP within the NGHGI:

- information on anthropogenic greenhouse gas emissions by sources and removals by sinks from LULUCF activities under KP's Article 3, paragraphs 3 and 4, in accordance with the provisions in Section I.D of the Annex to Decision 15-CMP. 1;
- information on Kyoto units (emission reduction units (ERUs), certified emission reductions (CERs), temporary certified emission reductions (tCERs), long-term certified emission reductions (lCERs), assigned amount units (AAUs) and removal units (RMUs)), as set out in Section I.E of the Annex to Decision 15/CMP. 1;
- changes in national systems in accordance with Article 5, paragraph 1, of the Kyoto Protocol, as set out in Section I.F of the Annex to Decision 15/CMP. 1;
- changes in national registries as set out in Section I.G of the Annex to Decision 15/CMP. 1;
- minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol, as set out in Section I.H of the Annex to Decision 15/CMP.

F. Undertake specific functions relating to inventory planning, preparation and management

Romania is undertaking all specific functions relating to inventory planning, preparation and management, in accordance with the specific provisions under the UNFCCC, KP and EU; their implementation is described below.

The elements on the implementation of NIA and NS inventory planning specific functions are presented below:

A. Designate a single national entity with overall responsibility for the national inventory

According to the GD no. 1570/2007 as ulteriorly modified and completed, the single national entity with overall responsibility for the national inventory, including with the responsibility of administrating the NIA and NS, is MEWF.

B. Make available the postal and electronic addresses of the national entity responsible for the inventory

The name and contact information for the national entity and its designated representative with overall responsibility for the national inventory are:

- national entity:
  - name: Ministry of Environment, Waters and Forests;
  - address: Bd. Libertăţii no. 12, Sector 5, Bucharest;
  - telephone: +40-21-4089551; fax: +40-21-4089550.
- designated representative with overall responsibility:
  - name: Sorin Deaconu;
  - telephone: +40-21-4089551; fax: +40-21-4089550.
  - e-mail: sorin.deaconu@mmediu.ro.

C. Define and allocate specific responsibilities in the inventory development process, including those relating to choice of methods, data collection, particularly activity data and emission factors from statistical services and other entities, processing and archiving, and QC and QA

Elements on defining and allocating specific responsibilities in the inventory development process include:

- the roles of, and cooperation between, government organizations and other entities involved in the inventory preparation, are established within the GD no. 1570/2007 as ulteriorly modified and completed;
- every person part of MEWF team managing the NIA and NS / NGHGI has assigned specific / clear attributions / responsibilities comprising (through individual Job fiche):
  - sector management;
  - implementation of other sector relevant activities:
    - key category analysis;
    - uncertainty analysis;
    - QA/QC;

- data/information archiving;
- coordinating the team/activities relevant to the NIA and NS / NGHGI administration;
- coordinating the QA/QC activities;
- managing the archiving system.

D. Elaborate an inventory QA/QC plan which describes specific QC procedures to be implemented during the inventory development process, facilitate the overall QA procedures to be conducted, to the extent possible, on the entire inventory and establish quality objectives

Specific elements comprise:

- QA/QC plan is part of the QA/QC Programme and of the MoEO no. 1602/2014 on approving the Quality Assurance and Quality Control Plan associated to the National Greenhouse Gas Inventory;
- QA/QC plan is intended to ensure the fulfillment of the NGHGI principles in Romania.

Main objectives of the plan include:

- applying greater QC effort for key categories and for those categories where data and methodological changes have occurred recently;
- periodically checking the validity of all information as changes in reporting, methods of collection or frequency of data collection occur;
- conducting the general procedures outlined in QC procedures (Tier 1) on all parts of the inventory over a complete exercise.

Detailed specific elements are presented within Section 2.2.3.

E. Establish processes for the official consideration and approval of the inventory, including any recalculations, prior to its submission and to respond to any issues raised by the inventory review process

Specific elements for the official consideration and approval of the inventory, including any recalculations, prior to its submission, comprise:

- defined within the GD no. 1570/2007 as ulteriorly modified and completed and within the MoEO no. 1376/2008;
- NGHGI verification and evaluation is performed at MEWF level;
- MEWF personnel with the attributions and responsibilities of preparing the NGHGI considers the observations and comments received, and as appropriate updates the NGHGI, aiming to its improvement, as soon as possible considering the relevant reporting guidelines.

In respect to the establishment of a process for responding to any issues raised by the inventory review process:

- based on GD no. 1570/2007, as ulteriorly modified and updated, and on MoEO no. 1376/2008 for approving the Procedure on NGHGI reporting and the modality for answering to the observations and questions raised following the NGHGI review, MEWF ensures the availability of human and financial resources for the implementation of review activities;
- MEWF ensures an efficient collaboration with the review teams under the coordination of the UNFCCC Secretariat, through the provision of all information and responses to the associated observations and questions, according to the relevant legal provisions.

Elements relevant to the implementation of the NIA and NS specific inventory preparation functions are described below:

A. Identify key source categories following the methods described in the IPCC good practice guidance

Specific elements comprise:

- key category analysis (KCA) is performed according to the provisions in Chapter 4 in Volume 1 of IPCC 2006, following the Approach 1;
- KCA was conducted both considering the exclusion and inclusion of the LULUCF sector and, also, both level and trend criteria;
- all IPCC sectors and categories, sources and sinks (as suggested in Table 4.1 of Volume 1 of IPCC 2006), and gases were analyzed;
- KCA was conducted for every year of the characterized period;
- results are presented in NIR, within:
  - Chapter 1, at general level;
  - Annex 1.
- KCA is used for prioritize efforts for improving the quality of the NGHGI-the relevant implemented and future studies refers mainly to the use of higher Tier methods on key categories.

Further elements are presented in Section 2.1.5.

B. Prepare estimates in accordance with the methods agreed to be used under UNFCCC and KP, and ensure that appropriate methods are used to estimate emissions from key source categories

Specific elements comprise:

- emissions from KP Annex A Sectors are estimated following the IPCC 2006;
- emissions/removals from LULUCF Sector are estimated following the IPCC 2006, Wetlands Supplement and KP Supplement;
- estimation methods selection is based on MoEO no. 1442/2014 on approving the Procedure on selection of the estimation methods and of the emission factors needed for the estimation of the GHG levels;

- ❖ higher estimates/tier estimates and a significant decrease of the number of categories characterized using the NE notation key are available for the majority of Annex A key categories due to:
  - o NEPA's/MECC's work;
  - o to the implementation of dedicated studies,
    - in 2011, "Elaboration/documentation of national emission factors/other parameters relevant to NGHGI Sectors Energy, Industrial Processes, Agriculture and Waste, values to allow for the higher Tier calculation methods implementation";
    - in 2013, "Elaboration and documentation of the parameters values relevant to the National Greenhouse Gas Inventory Industrial Processes Sector values to allow for the greenhouse gas emissions calculation methods, higher Tier methods, for the categories: Production of halocarbons and sulphur hexafluoride (HFCs, PFCs and SF_6), Consumption of halocarbons and sulphur hexafluoride (actual emissions), Consumption of halocarbons and sulphur hexafluoride (potential emissions)" and "Determination of the biodegradable content industrial wastes amount and of sludge amount from wastewater treatment, deposited in managed landfills (for the period 1989-2012) and in unmanaged landfills (for the period 1950-2012). Determination of incinerated wastes type/amount and of parameters specific to their incineration, for the period 1989-2012. Wastes incineration N_2O emissions estimation";
    - in 2014, "Elaboration and documentation of values for the parameters relevant to the National Greenhouse Gas Inventory Sector Industrial Processes and Product Use, values to allow for the implementation of the higher tier greenhouse gas emissions calculation methods for the categories Lime production, Glass production and Ammonia production, according to the IPCC 2006 methodology" and "Elaboration and documentation of values for the parameters relevant to the National Greenhouse Gas Inventory Sector Industrial Processes and Product Use, values to allow for the implementation of the higher tier greenhouse gas emissions calculation methods for the category Iron and steel production, according to the IPCC 2006 methodology".

- to the implementation of the Protocol of collaboration no. 3136/MMP/9.07.2012 between Ministry of Environment and Forests, NEPA, Romanian Automobile Register and Directorate on Driving Licenses and Vehicles Registration in the Ministry of Administration and Interior.

❖ development of emission/removal factors, higher estimates/tier estimates and a significant decrease of the number of categories characterized using the NE notation key are available for the LULUCF Sector under the UNFCCC and KP through the implementation of:

- the studies:
  - in 2011, "NGHGI LULUCF both under the UNFCCC and KP obligations";
  - in 2012, "Determination of emission/removal factors for the forest and for conversions from/to forest land associated pools both under UNFCCC and KP obligations" and "Compilation of the 2013 National Greenhouse Gas Inventory Land Use, Land-Use Change and Forestry Sector both under the UNFCCC and KP obligations";
  - in 2013, "Determination of emission-removal factors for the pools in forest areas and in areas in conversion from and to forest according with the obligations assumed as a Party to the UNFCCC and to the KP, for the 2014 year reporting" and "Compilation of the National Greenhouse Gas Inventory Land Use, Land-Use Change and Forestry Sector for the 2014 year associated reporting, according with the obligations assumed as a Party to the UNFCCC and to the KP";
  - in 2014, "Administration of the NGHGI Land Use, Land-Use Change and Forestry Sector (CRF Sector 4), according to the obligations in the United Nations Framework Convention on Climate Change, including those in the Kyoto Protocol".
- the Protocol of collaboration no. 3029/MMP-RP/3.07.2012 between Ministry of Environment and Forests, NEPA and ICAS.

❖ CORINAIR methodology was applied in case of the NGHGI Solvent and Other Product Use Sector.

Further specific elements are presented in Sections 2.1.3 and 2.1.4.

C. Collect sufficient activity data, process information and emission factors as are necessary to support the methods selected for estimating anthropogenic GHG emissions by sources and removals by sinks

Specific elements include:

- steps of data collection:
  - identification of data requirements;
  - identification of potential data suppliers;
  - preparation of specific templates;
  - submitting the requests and templates to the potential suppliers of data;
  - data collection;
  - data verification: activity data received are examined (time series discrepancies, large changes in values from the previous to the current inventory year), and double-checked against similar databases.
- the main activity data provider is the National Institute for Statistics;
- sources of emission factors/increment rates are: national studies, IPCC 2006, national research institutes and plants, in a limited number;
- data processing is performed according to the GD no. 1570/2007, as ulteriorly amended and completed, and to the MoEO no. 1474/2008 for approving the Procedure on processing, archiving and storage of data specific to the NGHGI. Primary data processing is mostly carried out by MEWF;
- emission factors (EFs) selection is performed according to the provisions in the MoEO no. 1442/2014 on approving the Procedure on selection of the estimation methods and of the emission factors needed for the estimation of the GHG levels;
- a significant amount of activity data and emission factors has been collected/ processed/ developed, enabling the development of higher estimates/tier estimates and the significant decrease of the number of categories characterized using the NE notation key for the majority of Annex A key categories, due to:
  - NEPA's/MEWF's work;
  - the implementation of dedicated studies:

- in 2011, "Elaboration/ documentation of national emission factors/other parameters relevant to NGHGI Sectors Energy, Industrial Processes, Agriculture and Waste, values to allow for the higher Tier calculation methods implementation";
- in 2013, "Elaboration and documentation of the parameters values relevant to the National Greenhouse Gas Inventory Industrial Processes Sector values to allow for the greenhouse gas emissions calculation methods, higher Tier methods, for the categories: Production of halocarbons and sulphur hexafluoride (HFCs, PFCs and SF_6), Consumption of halocarbons and sulphur hexafluoride (actual emissions), Consumption of halocarbons and sulphur hexafluoride (potential emissions)" and "Determination of the biodegradable content industrial wastes amount and of sludge amount from wastewater treatment, deposited in managed landfills (for the period 1989-2012) and in unmanaged landfills (for the period 1950-2012). Determination of incinerated wastes type/amount and of parameters specific to their incineration, for the period 1989-2012. Wastes incineration N_2O emissions estimation";
- in 2014, "Elaboration and documentation of values for the parameters relevant to the National Greenhouse Gas Inventory Sector Industrial Processes and Product Use, values to allow for the implementation of the higher tier greenhouse gas emissions calculation methods for the categories Lime production, Glass production and Ammonia production, according to the IPCC 2006 methodology" and "Elaboration and documentation of values for the parameters relevant to the National Greenhouse Gas Inventory Sector Industrial Processes and Product Use, values to allow for the implementation of the higher tier greenhouse gas emissions calculation methods for the category Iron and steel production, according to the IPCC 2006 methodology".

- the implementation of the Protocol of collaboration no. 3136/MMP/9.07.2012 between Ministry of Environment and Forests, NEPA, Romanian Automobile Register and Directorate on Driving Licenses and Vehicles Registration in the Ministry of Administration and Interior.

- optimizing the informational fluxes on data collection from the operators for the Energy Industries, Manufacturing Industries and Construction categories in the Energy Sector and for the Solid Waste Disposal on Land and Waste Water Handling categories in the Waste Sector was implemented subject to the "Environmental Integrated Informational System" study by the SC Asesoft International SA-SC Team Net International SA-SC Star Storage SRL consortium, based on a contract with NEPA;
- a significant amount of activity data and emission factors has been collected/ processed/ developed, enabling the development of higher estimates/ tier estimates and a significant decrease of the number of categories characterized using the NE notation key for the LULUCF Sector, both under the UNFCCC and KP, through the implementation of:
  - the studies:
    - in 2011, "NGHGI LULUCF both under the UNFCCC and KP obligations";
    - in 2012, "Determination of emission/removal factors for the forest and for conversions from/to forest land associated pools both under UNFCCC and KP obligations" and "Compilation of the 2013 National Greenhouse Gas Inventory Land Use, Land-Use Change and Forestry Sector both under the UNFCCC and KP obligations";
    - in 2013, "Determination of emission-removal factors for the pools in forest areas and in areas in conversion from and to forest according with the obligations assumed as a Party to the UNFCCC and to the KP, for the 2014 year reporting" and "Compilation of the National Greenhouse Gas Inventory Land Use, Land-Use Change and Forestry Sector for the 2014 year associated reporting, according with the obligations assumed as a Party to the UNFCCC and to the KP";
    - in 2014, "Administration of the NGHGI Land Use, Land-Use Change and Forestry Sector (CRF Sector 4), according to the obligations in the United Nations Framework Convention on Climate Change, including those in the Kyoto Protocol".
  - the Protocol of collaboration no. 3029/MMP-RP/3.07.2012 between Ministry of Environment and Forests, NEPA and ICAS.

Further elements are presented within the Section 2.1.4.

D. Make a quantitative estimate of inventory uncertainty for each source category and for the inventory in total, following the IPCC good practice guidance

Elements specific to the implementation of the NGHGI uncertainty analysis comprise:

- based on Approach 1 according to the provisions in Chapter 3 in Volume 1 of the IPCC 2006;
- performed for 2013, both excluding and including the LULUCF;
- based on national (NIS, "Elaboration/documentation of national emission factors/other parameters relevant to NGHGI Sectors Energy, Industrial Processes, Agriculture and Waste, values to allow for the higher Tier calculation methods implementation", "Elaboration and documentation of the parameters values relevant to the National Greenhouse Gas Inventory Industrial Processes Sector values to allow for the greenhouse gas emissions calculation methods, higher Tier methods, for the categories: Production of halocarbons and sulphur hexafluoride (HFCs, PFCs and SF_6), Consumption of halocarbons and sulphur hexafluoride (actual emissions), Consumption of halocarbons and sulphur hexafluoride (potential emissions)", "Determination of the biodegradable content industrial wastes amount and of sludge amount from wastewater treatment, deposited in managed landfills (for the period 1989-2012) and in unmanaged landfills (for the period 1950-2012). Determination of incinerated wastes type/amount and of parameters specific to their incineration, for the period 1989-2012. Wastes incineration N_2O emissions estimation", "NGHGI LULUCF both under the UNFCCC and KP obligations", "Compilation of the 2013 National Greenhouse Gas Inventory Land Use, Land-Use Change and Forestry Sector both under the UNFCCC and KP obligations", "Determination of emission-removal factors for the pools in forest areas and in areas in conversion from and to forest according with the obligations assumed as a Party to the UNFCCC and to the KP, for the 2014 year reporting" and "Compilation of the National Greenhouse Gas Inventory Land Use, Land-Use Change and Forestry Sector for the 2014 year associated reporting, according with the obligations assumed as a Party to the UNFCCC and to the KP", "Elaboration and documentation of values for the parameters relevant to the National Greenhouse Gas

Inventory Sector Industrial Processes and Product Use, values to allow for the implementation of the higher tier greenhouse gas emissions calculation methods for the categories Lime production, Glass production and Ammonia production, according to the IPCC 2006 methodology", "Elaboration and documentation of values for the parameters relevant to the National Greenhouse Gas Inventory Sector Industrial Processes and Product Use, values to allow for the implementation of the higher tier greenhouse gas emissions calculation methods for the category Iron and steel production, according to the IPCC 2006 methodology" and "Administration of the NGHGI Land Use, Land-Use Change and Forestry Sector (CRF Sector 4), according to the obligations in the United Nations Framework Convention on Climate Change, including those in the Kyoto Protocol" studies), study on Romanian uncertainty information and data performed in 2012 by the Environment Agency of Austria-University of Graz consortium (uncertainty data have been collected through interviews, based on the collaboration between "Environmental Integrated Informational System" study contractor, Environment Agency of Austria-University of Graz consortium, data providers and NEPA), and default AD and EFs uncertainty sources;

- results are presented within the NIR, in:
  - Uncertainties and time series consistency sub-sectorial sections;
  - in Annex 2.
- uncertainty analysis results are used for prioritize efforts for improving the quality of the NGHGI-in the implementation of progresses, highest priority is attributed to categories having associated high uncertainty level.

Further elements are provided within the Section 2.1.6.

E. Ensure that any recalculations of previously submitted estimates of anthropogenic GHG emissions by sources and removals by sinks are prepared in accordance with the IPCC good practice guidance and relevant decisions of the COP and/or COP/MOP

The elements associated to the implementation of recalculations comprise:

- based on IPCC 2006 (and previous to 2015 submission on IPCC GPG 2000 and on IPCC GPG 2003), Romania implemented significant recalculations in order to account for better AD and/or EFs, mainly based on:
  - NEPA's/MEWF's work;
  - on the studies implemented:
    - in 2011, "Elaboration/documentation of national emission factors/other parameters relevant to NGHGI Sectors Energy, Industrial Processes, Agriculture and Waste, values to allow for the higher Tier calculation methods implementation" and "NGHGI LULUCF both under the UNFCCC and KP obligations";
    - in 2012, "Compilation of the 2013 National Greenhouse Gas Inventory Land Use, Land-Use Change and Forestry Sector both under the UNFCCC and KP obligations";
    - in 2013, "Elaboration and documentation of the parameters values relevant to the National Greenhouse Gas Inventory Industrial Processes Sector values to allow for the greenhouse gas emissions calculation methods, higher Tier methods, for the categories: Production of halocarbons and sulphur hexafluoride (HFCs, PFCs and SF_6), Consumption of halocarbons and sulphur hexafluoride (actual emissions), Consumption of halocarbons and sulphur hexafluoride (potential emissions)", "Determination of the biodegradable content industrial wastes amount and of sludge amount from wastewater treatment, deposited in managed landfills (for the period 1989-2012) and in unmanaged landfills (for the period 1950-2012). Determination of incinerated wastes type/amount and of parameters specific to their incineration, for the period 1989-2012. Wastes incineration N_2O emissions estimation", "Determination of emission-removal factors for the pools in forest areas and in areas in conversion from and to forest according with the obligations assumed as a Party to the UNFCCC and to the KP, for the 2014 year reporting" and "Compilation of the National Greenhouse Gas Inventory Land Use, Land-Use Change and Forestry Sector for the 2014 year associated reporting, according with the obligations assumed as a Party to the UNFCCC and to the KP";

- in 2014, "Elaboration and documentation of values for the parameters relevant to the National Greenhouse Gas Inventory Sector Industrial Processes and Product Use, values to allow for the implementation of the higher tier greenhouse gas emissions calculation methods for the categories Lime production, Glass production and Ammonia production, according to the IPCC 2006 methodology", "Elaboration and documentation of values for the parameters relevant to the National Greenhouse Gas Inventory Sector Industrial Processes and Product Use, values to allow for the implementation of the higher tier greenhouse gas emissions calculation methods for the category Iron and steel production, according to the IPCC 2006 methodology" and "Administration of the NGHGI Land Use, Land-Use Change and Forestry Sector (CRF Sector 4), according to the obligations in the United Nations Framework Convention on Climate Change, including those in the Kyoto Protocol".

- on the Protocol of collaboration no. 3136/MMP/9.07.2012 between Ministry of Environment and Forests, NEPA, Romanian Automobile Register and Directorate on Driving Licenses and Vehicles Registration in the Ministry of Administration and Interior, and on the Protocol of collaboration no. 3029/MMP-RP/3.07.2012 between Ministry of Environment and Forests, NEPA and ICAS.

❖ the recalculations resulted in significant increase of the accuracy, completeness and consistency of data series;

❖ the recalculations are presented in NIR in:

- Source-specific recalculations, including changes made in response to the review process sub-sectorial sections, including the quantified impact;
- Chapter 10 Recalculations.

F. Compile the national inventory in accordance with the relevant provisions under UNFCCC and KP

Specific elements on the compilation of the national inventory include:

- NGHGI has been compiled based on Guidelines for the preparation of national communications by Parties included in Annex 1 to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories (FCCC/CP/2013/10/Add. 3; UNFCCC Reporting Guidelines);
- beginning with the 2010 submission, the NIR is compiled according to the recommendations for inventories set out in the Annotated outline of the National Inventory Report including reporting elements under the Kyoto Protocol;
- all additional reporting elements under Article 7 paragraph 1 of the KP are reported, beginning with the 2010 submission.

G. Implementing the QA/QC and verification procedures in accordance with its QA/QC plan following the IPCC good practice guidance

The elements specific to the implementation of QA/QC procedures are:

- the QA/QC Programme and the QA/QC Procedure comprise information on:
  - the national authority responsible for the coordination of QA/QC activities;
  - the objectives envisaged within the QA/QC framework;
  - the QA/QC Plan;
  - the QC procedures;
  - the QA procedures.
- according to the GD no. 1570/2007 as ulteriorly modified and completed establishing the national inventory arrangements and national system and to the MoEO no. 1602/2014 on approving the Quality Assurance and Quality Control Plan associated to the National Greenhouse Gas Inventory, MEWF represents the competent authority responsible with the implementation of the QA/QC activities;
- the QA/QC coordinator is designated by MEWF;
- QC activities were implemented:
  - by every sectorial expert during all phases of inventory preparation;
  - by NGHGI improvement studies contractors
    - in 2011, "Elaboration/documentation of national emission factors/other parameters relevant to NGHGI Sectors Energy, Industrial Processes,

Agriculture and Waste, values to allow for the higher Tier calculation methods implementation" and "NGHGI LULUCF both under the UNFCCC and KP obligations";

- in 2012, "Compilation of the 2013 National Greenhouse Gas Inventory Land Use, Land-Use Change and Forestry Sector both under the UNFCCC and KP obligations";
- in 2013, "Elaboration and documentation of the parameters values relevant to the National Greenhouse Gas Inventory Industrial Processes Sector values to allow for the greenhouse gas emissions calculation methods, higher Tier methods, for the categories: Production of halocarbons and sulphur hexafluoride (HFCs, PFCs and SF_6), Consumption of halocarbons and sulphur hexafluoride (actual emissions), Consumption of halocarbons and sulphur hexafluoride (potential emissions)", "Determination of the biodegradable content industrial wastes amount and of sludge amount from wastewater treatment, deposited in managed landfills (for the period 1989-2012) and in unmanaged landfills (for the period 1950-2012). Determination of incinerated wastes type/amount and of parameters specific to their incineration, for the period 1989-2012. Wastes incineration N_2O emissions estimation", "Determination of emission-removal factors for the pools in forest areas and in areas in conversion from and to forest according with the obligations assumed as a Party to the UNFCCC and to the KP, for the 2014 year reporting" and "Compilation of the National Greenhouse Gas Inventory Land Use, Land-Use Change and Forestry Sector for the 2014 year associated reporting, according with the obligations assumed as a Party to the UNFCCC and to the KP";
- in 2014, "Elaboration and documentation of values for the parameters relevant to the National Greenhouse Gas Inventory Sector Industrial Processes and Product Use, values to allow for the implementation of the higher tier greenhouse gas emissions calculation methods for the categories Lime production, Glass production and Ammonia production, according to the IPCC 2006 methodology", "Elaboration and documentation of values for the parameters relevant to the National Greenhouse Gas Inventory Sector Industrial

Processes and Product Use, values to allow for the implementation of the higher tier greenhouse gas emissions calculation methods for the category Iron and steel production, according to the IPCC 2006 methodology" and "Administration of the NGHGI Land Use, Land-Use Change and Forestry Sector (CRF Sector 4), according to the obligations in the United Nations Framework Convention on Climate Change, including those in the Kyoto Protocol".

- documented within sectorial QC lists consistently used across the dedicated NIA and NS / NGHGI dedicated team;
- greater effort was applied to key categories.

- QA activities:
  - NGHGI was subject to the annual internal review under EU-Monitoring Mechanism;
  - in 2012, NGHGI was reviewed under the Decision no. 406/2009/EC of the European Parliament and of the Council on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020;
  - involvement of third party reviewers in the context of developing studies for NGHGI quality improvement;
  - based on previous bilateral cooperation;
  - based on annual review process under UNFCCC and KP.
- verification-where available, national versus international datasets are compared (e.g. comparison of national with Food and Agriculture Organization data);
- NGHGI improvement plan is annually updated by the QA/QC coordinator based on the results of the previously mentioned checks; the NGHGI improvement plan is linked with the NGHGI preparation plan administered by the NGHGI coordinator;
- greater effort was applied to the implementation of sector-specific QC, QA and verification activities.

Further relevant information is presented under Section 2.1.2.3.

Elements characterizing the implementation of the NIA and NS inventory management related functions are described below:

A. Archive inventory information for each year in accordance with relevant decisions of the COP and/or COP/MOP

Elements specific to the archiving of NGHGI data/information include:

- the activities are implemented based on the GD no. 1570/2007, as ulteriorly modified and completed, and on the MoEO no. 1474/2008 for approving the Procedure on processing, archiving and storage of data specific to the NGHGI;
- both electronic and paper documentation, as far as needed to reconstruct and interpret inventory data and to describe the national inventory arrangements and national system and their functions, is archived;
- the archive is managed by MEWF and is accessible at a single location at the MEWF's headquarters in Bucharest;
- all information officially submitted is available in English, while not all background information is available in English;
- security of databases and confidentiality of the background data, both for electronic and paper data, are ensured through implementation of restricted access conditions;
- MEWF designated the manager of the archiving system.

More relevant detailed elements are provided within Section 2.1.3.2.

B. Provide review teams with access to all archived information used by the Party to prepare the inventory, in accordance with relevant decisions of the COP and/or COP/MOP

Based on GD no. 1570/2007, as ulteriorly modified and completed, and on MoEO no. 1376/2008 for approving the Procedure on NGHGI reporting and the modality for answering to the observations and questions raised following the NGHGI review, MEWF is providing review teams with access to all archived information used to prepare the inventory, in accordance with relevant decisions of the COP and/or COP/MOP.

C. Respond to requests for clarifying inventory information resulting from the different stages of the review process of the inventory information, and information on the national inventory arrangements and national system, in a timely manner

Relevant elements comprise:

- based on GD no. 1570/2007, as ulteriorly modified and completed, and on MoEO no. 1376/2008 for approving the Procedure on NGHGI reporting and the modality for answering to the observations and questions raised following the NGHGI review, MEWF ensures the availability of human and financial resources for the implementation of review activities;
- MEWF ensures an efficient collaboration with the review teams under the coordination of the UNFCCC Secretariat, through the provision of all information and responses to the associated observations and questions, according to the relevant legal provisions.

2.1.2.2 Overview of inventory planning, preparation and management including for supplementary information required under Article 7, paragraph 1, of the Kyoto Protocol

According to the GD no. 1570/2007 as ulteriorly modified and completed, the single national entity with overall responsibility for the national inventory, including with the responsibility of administrating the NIA and NS, is MEWF; more detailed elements of inventory planning are included in Section 2.1.2.1

MEWF has also the obligation of the preparation and management of the GHGI; in this sense, the Governmental Decision no. 1570/2007 as ulteriorly modified and completed and the subsequent relevant procedures supports MEWF by defining a legal, institutional and procedural framework to involve actively all the relevant responsible public authorities, different research institutes, economic operators, and professional associations.

Central public authorities and the institutions under their authority, in their coordination or subordination, different research institutes, and the economic operators have the responsibility for submitting activity data needed for the GHG emissions/removals calculation.

The main activity data supplier is the National Institute for Statistics (NIS) through the yearly-published documents like the National Statistical Yearbook and the Energy Balance. In 2011 the Forest Research and Management Planning Institute administrated the NGHGI LULUCF Sector, both under the UNFCCC and the KP, based on a contract with MEF, in the context of the implementation of the study "NGHGI LULUCF both under the UNFCCC and KP obligations"; the main activities implemented comprise also:

- preparation of the LULUCF emissions/removals estimates according also with the provisions in the IPCC GPG 2003; consequently, the completion of databases and associated CRF Tables and elaboration of NIR;
- implementing the QC activities;
- documenting associated to the NGHGI LULUCF Sector;
- representing Romania during the annual review coordinated by the UNFCCC Secretariat.

During the period 2012-2014, ICAS continued the implementation of activities on administrating the LULUCF Sector, both under the UNFCCC and the KP, based on the Protocol of collaboration no. 3029/MMP-RP/3.07.2012 between Ministry of Environment and Forests, NEPA and ICAS; ICAS also contributed by developing, in 2012, the studies "Determination of emission/removal factors for the forest and for conversions from/to forest land associated pools both under UNFCCC and KP obligations", study concluded with the establishment of methodologies for determining national values for emissions/removals factors, and "Compilation of the 2013 National Greenhouse Gas Inventory Land Use, Land-Use Change and Forestry Sector both under the UNFCCC and KP obligations" based on contracts with Ministry of Environment and Forests.

In 2013, ICAS contributed to the determination of country-specific emissions-removals factors, elaborating the study "Determination of emission-removal factors for the pools in forest areas and in areas in conversion from and to forest according with the obligations assumed as a Party to the UNFCCC and to the KP, for the 2014 year reporting" and to the compilation of the NGHGI LULUCF Sector through developing the study "Compilation of the National Greenhouse Gas Inventory Land Use, Land-Use Change and Forestry Sector for the 2014 year associated reporting, according with the obligations assumed as a Party to the UNFCCC and to the KP".

In 2014, ICAS contributed further by developing the study "Administration of the NGHGI Land Use, Land-Use Change and Forestry Sector (CRF Sector 4), according to the obligations in the United Nations Framework Convention on Climate Change, including those in the Kyoto Protocol"; in this context activity data and emissions-removals factors continued to be developed while the compilation of the LULUCF Sector was continued.

The collection of necessary data/information and the use of appropriate methods for estimating the emissions for the KP Annex A key categories have been significantly improved during 2011 following the implementation by ISPE, based on a contract with the MEF, of the study "Elaboration/documentation of national emission factors/other parameters relevant to NGHGI Sectors Energy, Industrial Processes, Agriculture and Waste, values to allow for the higher Tier calculation methods implementation"; main activities part of the study comprised:

- collect/process/develop specific data/information in order to support the use of appropriate methods for key categories;
- document the collected/processed/developed data/information;
- implement QA/QC checks;
- provide associated uncertainty values.

ISPE contributed further to the development of country-specific data by developing:

- in 2013 the study, "Determination of the biodegradable content industrial wastes amount and of sludge amount from wastewater treatment, deposited in managed landfills (for the period 1989-2012) and in unmanaged landfills (for the period 1950-2012). Determination of incinerated wastes type/amount and of parameters specific to their incineration, for the period 1989-2012. Wastes incineration N_2O emissions estimation";
- in 2014, the studies "Elaboration and documentation of values for the parameters relevant to the National Greenhouse Gas Inventory Sector Industrial Processes and Product Use, values to allow for the implementation of the higher tier greenhouse gas emissions calculation methods for the categories Lime production, Glass production and Ammonia production, according to the IPCC 2006 methodology" and "Elaboration and documentation of values for the parameters relevant to the National Greenhouse Gas Inventory Sector Industrial Processes and Product Use, values to allow for the

implementation of the higher tier greenhouse gas emissions calculation methods for the category Iron and steel production, according to the IPCC 2006 methodology".

Based on the implementation in 2013 of the study "Elaboration and documentation of the parameters values relevant to the National Greenhouse Gas Inventory Industrial Processes Sector values to allow for the greenhouse gas emissions calculation methods, higher Tier methods, for the categories: Production of halocarbons and sulphur hexafluoride (HFCs, PFCs and SF_6), Consumption of halocarbons and sulphur hexafluoride (actual emissions), Consumption of halocarbons and sulphur hexafluoride (potential emissions)", Denkstat improved the system of administrating the HFCs, PFCs and SF_6 data and information.

On an undetermined period, the preparation of Road transport category estimates based on COPERT 4 model is administered also based on the Protocol of collaboration no. 3136/MMP/9.07.2012 between Ministry of Environment and Forests, NEPA, Romanian Automobile Register and Directorate on Driving Licenses and Vehicles Registration in the Ministry of Administration and Interior.

The Ministry of Environment and Climate Change submits officially the national GHGI to the UNFCCC Secretariat, the European Commission and the European Environment Agency taking into account the specific deadlines.

2.1.2.3 Quality assurance, quality control and verification plan on GHG inventory and KP-LULUCF inventory

Romania established the QA/QC Procedure based on the UNFCCC and Kyoto Protocol's provisions related to the NGHGI, NIA and NS, the IPCC 2006 provisions, and on the Governmental Decision no. 1570/2007 establishing the National System for the estimation of the anthropogenic GHG emissions levels from sources and removals by sinks, as ulteriorly modified and completed. QA/QC activities are both described within the QA/QC Programme and within the QA/QC Procedure related to the NGHGI, approved by the MoEO no. 1602/2014.

2.1.2.3.1 QA/QC procedures

The QA/QC Programme and the QA/QC Procedure comprise information on:

- the national authority responsible for the coordination of QA/QC activities;
- the objectives envisaged within the QA/QC framework;
- the QA/QC Plan;
- the QC procedures;
- the QA procedures.

According to the provisions of the Governmental Decision no. 1570/2007 establishing the national inventory arrangements and national system, as ulteriorly modified and completed, and to those in the MoEO no. 1602/2014 on approving the Quality Assurance and Quality Control Plan associated to the National Greenhouse Gas Inventory, MEWF represents the competent authority responsible with the implementation of the QA/QC activities under the NGHGI.

For this purpose, MEWF is performing the following activities:

- ensures that specific QA/QC objectives are established;
- develops and regularly updates a QA/QC plan;
- implements the QA/QC procedures.

Considering the provisions of relevant regulations, MEWF designated a QA/QC coordinator.

The overall objective of the QA/QC Programme is to develop the NGHGI in line with the requirements of the IPCC 2006, Wetlands Supplement and KP Supplement and with the provisions of the Regulation no. 525/2013 of the European Parliament and of the Council and of the Commission Implementing Regulation (EU) no. 749/2014.

Romania's QA/QC plan closely follows the definitions, guidelines and processes presented in Chapter 6 – Quality Assurance/Quality Control and Verification in Volume 1 of IPCC 2006. The QA/QC plan constitutes the heart of the QA/QC procedures. It outlines the current and planned QA/QC activities. The specific QA/QC activities are performed during all stages of the inventory preparation.

The QA/QC plan is reviewed periodically, if needed, and can be modified as appropriate when changes in processes occur or based on the advice from independent reviewers.

The QA/QC plan is intended to ensure the fulfillment of the NGHGI principles in Romania. The objectives of the plan include:

- applying greater QC effort for key categories and for those categories where data and methodological changes have occurred recently;

- periodically checking the validity of all information as changes in reporting, methods of collection or frequency of data collection occur;
- conducting the general procedures outlined in QC procedures (Tier 1) on all parts of the inventory over a complete exercise;
- balancing efforts between development and implementation of QA/QC procedures and continuous improvement of inventory estimates;
- customizing the QC procedures to the resources available and the particular characteristics of Romania's greenhouse gas inventory;
- confirming that the national statistical institute and other agencies supplying activity data to MECC have implemented QC procedures.

2.1.2.3.2 QC activities

QC activities were implemented by every sectorial expert during all phases of inventory preparation, greater effort being applied to key categories.

The following QC activities are conducted annually before and during the preparation of estimates (15 September-30 October):

- checking the specific requirements regarding the reporting deadlines;
- verification of the collection of data against the information needed;
- checking the correct transcription of input data from the format they were provided into the calculation sheets;
- checking the correctness of conversion factors to be used in calculation;
- checking the data structures integrity and the disaggregation of activity data at calculation sheets level;
- checking the concordance between the measurement units of data in the calculation sheets and the equivalent data in the CRF Reporter format;
- checking the consistency and the data values magnitude order used in the AD and EF series, at the calculation sheets level;
- identifying parameters common to multiple source or sink categories and checking the values consistency between source or sink categories;

- checking the emissions/removals calculation into the calculation sheets by reproducing a representative sample calculation;
- checking the correctness of the aggregation of estimated emissions/removals at the calculation sheets level.

The following QC activities are conducted annually during and after the preparation of estimates (15 October - 10 January - 10 March):

- checking the emissions/removals estimates existence for all sources and sinks and for the entire time series;
- checking the explanations existence when the emissions/removals estimates are lacking;
- checking the correctness and consistency of choosing the AD, EF and methods used along the entire time series;
- checking the trends for identifying the outliers and re-analyze the values;
- checking the correctness of recalculations and the existence of explanations;
- checking the recording and archiving of AD, EF and methods used;
- checking the correctness and the completeness of the data transcription from the calculation sheets level to the CRF Reporter level;
- checking the correctness and the completeness of the data transcription from the CRF Reporter level to the CRF tables level;
- checking the data used in the NIR against the CRF tables and calculation sheets;
- checking the correctness of applied methods descriptions, at the NIR's level;
- checking the references completeness at the NIR's level;
- checking the archiving of the CRF tables, NIR, CRF Reporter's specific databases and the calculation sheets;
- checking the key categories persistency along the time series;
- checking the adequate qualification of individuals providing expert judgments on the uncertainty estimates and the archiving of documentation regarding the qualification and the expert judgments;
- checking the uncertainty calculation correctness by partially replying the Monte Carlo analysis;
- verification of the ERT recommendations implementation;

- checking the completeness of the QA/QC documentation archiving: QA/QC programme, checklists, ERT report, improvements lists;
- checking the QA/QC Programme performance and propose improvements.

Within the specified deadlines, the previously mentioned activities are performed at sectorial level. Based on specific sectorial responsibilities allocated within the sector, the QC checks are performed for certain category by a sectorial expert not being involved in the administration, including estimating emissions / removals, of that category (cross-checking approach).

The results of all checks outlined above are documented in the annual QC checklists for inventory preparation. For this purpose QC checklists are used consistently throughout the years by all experts involved in the inventory preparation.

Additionally, QC activities were performed by the study contractors implementing the NGHGI improvement studies:

- in 2011,
  - "Elaboration/documentation of national emission factors/other parameters relevant to NGHGI Sectors Energy, Industrial Processes, Agriculture and Waste, values to allow for the higher Tier calculation methods implementation";
  - "NGHGI LULUCF both under the UNFCCC and KP obligations".
- in 2012,
  - "Determination of emission/removal factors for the forest and for conversions from/to forest land associated pools both under UNFCCC and KP obligations";
  - "Compilation of the 2013 National Greenhouse Gas Inventory Land Use, Land-Use Change and Forestry Sector both under the UNFCCC and KP obligations".
- in 2013,
  - "Elaboration and documentation of the parameters values relevant to the National Greenhouse Gas Inventory Industrial Processes Sector values to allow for the greenhouse gas emissions calculation methods, higher Tier methods, for the categories: Production of halocarbons and sulphur hexafluoride (HFCs, PFCs and SF_6), Consumption of halocarbons and sulphur hexafluoride (actual emissions), Consumption of halocarbons and sulphur hexafluoride (potential emissions)";
  - "Determination of the biodegradable content industrial wastes amount and of sludge amount from wastewater treatment, deposited in managed landfills (for the period

1989-2012) and in unmanaged landfills (for the period 1950-2012). Determination of incinerated wastes type/amount and of parameters specific to their incineration, for the period 1989-2012. Wastes incineration N_2O emissions estimation";

- "Determination of emission-removal factors for the pools in forest areas and in areas in conversion from and to forest according with the obligations assumed as a Party to the UNFCCC and to the KP, for the 2014 year reporting";
- "Compilation of the National Greenhouse Gas Inventory Land Use, Land-Use Change and Forestry Sector for the 2014 year associated reporting, according with the obligations assumed as a Party to the UNFCCC and to the KP".

❖ in 2014:

- "Elaboration and documentation of values for the parameters relevant to the National Greenhouse Gas Inventory Sector Industrial Processes and Product Use, values to allow for the implementation of the higher tier greenhouse gas emissions calculation methods for the categories Lime production, Glass production and Ammonia production, according to the IPCC 2006 methodology";
- "Elaboration and documentation of values for the parameters relevant to the National Greenhouse Gas Inventory Sector Industrial Processes and Product Use, values to allow for the implementation of the higher tier greenhouse gas emissions calculation methods for the category Iron and steel production, according to the IPCC 2006 methodology";
- "Administration of the NGHGI Land Use, Land-Use Change and Forestry Sector (CRF Sector 4), according to the obligations in the United Nations Framework Convention on Climate Change, including those in the Kyoto Protocol".

2.1.2.3.3 QA activities

By becoming an European Union Member State from the 1st of January 2007, Romania has the obligation to prepare and submit the NGHGI according to the Regulation no. 525/2013 of the European Parliament and of the Council and to the Commission Implementing Regulation (EU) no. 749/2014, which provides for a QA activity after the first submission of data on 15th of January and a final QA for all 28 EU Member States during first half of March, for the

preparation of the EC inventory. In this respect, starting with 2007, Romania has the possibility to verify the inventory twice before the official submission to the UNFCCC Secretariat.

In order to get an objective assessment of the inventory quality and for identifying areas where improvements can be made, MEWF involve third party reviewers at the QA activities level according to the provisions in IPCC good practice guidance, depending on the availability of resources. In this scope, MEWF is developing the specific procedural arrangements. MEWF through its international contacts and bilateral agreements identifies the available processes for ensuring the implementation of QA activities.

Until now, NEPA was the beneficiary of technical support provided by the Austrian Environment Agency (as part of the twinning project RO/2006/IB/EN/09). One of the most important activities performed within this framework was the review of different sectors of the NGHGI. Austrian experts provided specific recommendations comprising:

- improvement of transparency at sectorial level considering the trend and recalculations description;
- improvement of transparency at sectorial level by providing a cumulative table on the status of emissions/removals estimation for every sub-sector;
- improvement on knowledge on practical ways of performing and documenting the QA/QC activities;
- improvement of the NGHGI archiving structure.

Until first half of 2011, NGHGI team was the beneficiary of a Netherlands Government to Government (G2G) project. One of its main aims is to develop the reporting capacity of the NGHGI team also by assessing the possibility to use higher tier methods. Specific activities comprised:

- advices on improving the NGHGI sectorial data documentation (through the use of the documentation list);
- training courses/presentations on use of data specific to other reporting mechanisms at the GHG Inventory level:
  - use of ETS data;
  - use of COPERT model.
- discussions/advices on methodological issues (data collection, emissions estimation) on GHG emissions recovery within the Industrial Processes and Waste activities;

- advices on moving to higher Tier levels in the Energy Sector:
  - calculation of specific emission factors;
  - use of COPERT model in estimating the Road Transport emissions.
  - advices on using national data for the calculation of natural gas transit fugitive emissions;
  - advices on moving on Tier 2 at the Enteric Fermentation, Manure Management and Agricultural Soils levels:
    - precise identification of activity data needs;
    - workshop on elaborating the specific requirements for a emission factors/other parameters study development;
    - other relevant advices.
- advices on moving on First Order Decay method at the Solid Waste Disposal Sites level;
- other advices relevant to the Waste Sector;
- identification of the practical ways to complete the estimation of emissions/ removals specific to Kyoto Protocol's Art. 3.3 and 3.4 activities: afforestation/ reforestation/ deforestation, forest management and revegetation.

QA activities were also performed, according to the relevant provisions in IPCC good practice guidance, in the context of elaboration of the NGHGI improvement studies:

- in 2011,
  - "Elaboration/documentation of national emission factors/other parameters relevant to NGHGI Sectors Energy, Industrial Processes, Agriculture and Waste, values to allow for the higher Tier calculation methods implementation".
- in 2013,
  - "Elaboration and documentation of the parameters values relevant to the National Greenhouse Gas Inventory Industrial Processes Sector values to allow for the greenhouse gas emissions calculation methods, higher Tier methods, for the categories: Production of halocarbons and sulphur hexafluoride (HFCs, PFCs and SF_6), Consumption of halocarbons and sulphur hexafluoride (actual emissions), Consumption of halocarbons and sulphur hexafluoride (potential emissions)";

- "Determination of the biodegradable content industrial wastes amount and of sludge amount from wastewater treatment, deposited in managed landfills (for the period 1989-2012) and in unmanaged landfills (for the period 1950-2012). Determination of incinerated wastes type/amount and of parameters specific to their incineration, for the period 1989-2012. Wastes incineration N_2O emissions estimation";
- "Determination of emission-removal factors for the pools in forest areas and in areas in conversion from and to forest according with the obligations assumed as a Party to the UNFCCC and to the KP, for the 2014 year reporting";
- "Compilation of the National Greenhouse Gas Inventory Land Use, Land-Use Change and Forestry Sector for the 2014 year associated reporting, according with the obligations assumed as a Party to the UNFCCC and to the KP".

❖ in 2014,

- "Elaboration and documentation of values for the parameters relevant to the National Greenhouse Gas Inventory Sector Industrial Processes and Product Use, values to allow for the implementation of the higher tier greenhouse gas emissions calculation methods for the categories Lime production, Glass production and Ammonia production, according to the IPCC 2006 methodology";
- "Elaboration and documentation of values for the parameters relevant to the National Greenhouse Gas Inventory Sector Industrial Processes and Product Use, values to allow for the implementation of the higher tier greenhouse gas emissions calculation methods for the category Iron and steel production, according to the IPCC 2006 methodology";
- "Administration of the NGHGI Land Use, Land-Use Change and Forestry Sector (CRF Sector 4), according to the obligations in the United Nations Framework Convention on Climate Change, including those in the Kyoto Protocol".

Additionally, in 2012, the NGHGI has been subject to a thorough review within the European Union, review under the Decision 406/2009/EC on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020; also, in 2015, the inventory was reviewed in the context of annual monitoring and compliance cycle.

National inventory submissions to the UNFCCC Secretariat are subject to the review under UNFCCC and Kyoto Protocol and procedures defined in the relevant COP/MOP decisions.
All recalculations planned and done (including those following the UNFCCC ERT review) are mentioned in the improvements lists.
The results of QA checks (excepting those of checks performed under Regulation no. 525/2013, Commission Implementing Regulation (EU) no. 749/2014 and 406/2009/EC and, respectively, by ERT) are documented in the annual QA checklists for inventory preparation. For this purpose, QA checklists are used consistently throughout the years by all inventory experts involved in the inventory compilation.

2.1.2.3.4 Verification activities

Several verification activities were performed by the NGHGI team, as follows:

- Energy – comparison of activity data used with Eurostat equivalent data; additionally, comparison of country-specific CO_2 emission factors values with equivalent data in the NGHGI of Bulgaria;
- Agriculture - comparison of data sets used with relevant FAO and, respectively, Eurostat data; additionally, country-specific parameters were compared with similar parameters in the Bulgarian and Hungarian NGHGI and, respectively, with default parameters;
- Waste – comparison of data sets used with Eurostat and FAO data.

All verification activities are described in detail within the sectorial Category-specific QA/QC and verification sections.

Greater effort has been applied to the implementation of sector-specific QC, QA and verification activities; the following sector-specific QC, QA and verification activities are conducted annually before, during and after the preparation of estimates:

- intra-sectoral activities
  - automated data validation within the Excel model-validation is implemented on the consideration of any activity data value provided through the Energy Balance and

concerning an inventory specific activity, and on the range of the determined country-specific emission factors as defined within the relevant IPCC methodologies; the model is directly linked to the International Energy Agency and Eurostat versions of the Energy Balance provided by the National Institute for Statistics and to the determination of the country-specific or default emission factors spreadsheets (Energy Sector-stationary combustion and Reference Approach);

- manual checks on all spreadsheets part of the model presented at the previous point (Energy Sector-stationary combustion and Reference Approach);
- manual checks on all spreadsheets on renewable fuel combustion; the spreadsheets are directly linked to the International Energy Agency and Eurostat versions of the Energy Balance and to the default emission factors spreadsheets (Energy Sector - stationary combustion and Reference Approach);
- manual checks on all spreadsheets on Fugitive Emissions Subsector; the spreadsheets are directly linked to the International Energy Agency and Eurostat versions of the Energy Balance and to the used emission factors spreadsheets (Energy Sector - Fugitive Emissions from Fuels Subsector);
- implementing an analysis on the share of European Union-Emission Trading Scheme to Energy Balance fuel consumption data, in respect to equivalent activity categories (Energy Sector except the Fugitive Emissions from Fuels Subsector, Reference Approach);
- checks specific to country-specific emission factors determination, based on background data reported under the European Union Emission Trading Scheme and validated through the reports of Romanian Accreditation Association (RENAR) accredited verifiers (Energy Sector except the Fugitive Emissions from Fuels Subsector, Reference Approach);
- checks on the correlation between energy demand and energy resources data in the Energy Balance (Energy Sector except the Fugitive Emissions from Fuels Subsector, Reference Approach);
- implementation of a comparative analysis of country-specific emission factors and associated uncertainties with equivalent international data, mostly from the countries

having similar national circumstances (technologies, the same fuels sources) (Energy Sector except the Fugitive Emissions from Fuels Subsector);

- check on the potential double accounting cases through the use of carbon balance (Industrial Processes and Product Use Sector);
- implement cross-category checks for emissions from categories calculated using Tier 1 default emission factors that do not specifically account for the sources of carbon (Industrial Processes and Product Use Sector);
- implementing an analysis on the share of European Union-Emission Trading Scheme to National Greenhouse Gas Inventory data, in respect to equivalent activity categories (Industrial Processes and Product Use Sector);
- comparison of the Enteric Fermentation and Manure Management Subsectors country-specific emission factors data and information with equivalent international data and information, especially in respect with elements available within countries with similar technical conditions (livestock characteristics, Animal Manure Management Systems characteristics) (Agriculture Sector-Enteric Fermentation and Manure Management Subsectors).

❖ intersectoral activities:

- checks of the outliers on the fuel mix and on the energy consumption data changes, and of double accounting potential cases (Energy Sector except the Fugitive Emissions from Fuels Subsector and Reference Approach, and Industrial Processes and Product Use Sector);
- check on the correct allocation of the emissions estimates/potential double accounting cases associated with the recovery of the energy resulted from the biomass incineration (Energy Sector-stationary combustion and Agriculture Sector-agricultural soils);
- check on the correct allocation of the emissions estimates/potential double accounting cases associated with the recovery of the energy resulted from the biomass incineration (Energy Sector-stationary combustion and Land-Use, Land-Use Change and Forestry Sector);

- comparison of activity data on the CH_4 recovery for valorizing from solid waste disposal on land facilities with corresponding data in the Energy Sector (Energy Sector-stationary combustion and Waste Sector-Solid Waste Disposal Subsector);
- check on the correct allocation of the emissions estimates/potential double accounting cases associated with the recovery of the energy resulted from the waste incineration (Energy Sector-stationary combustion Subsector and Waste Sector-Incineration and Open Burning of Waste Subsector);
- check the potential occurrence of double accounting cases between the Agriculture and Land Use, Land-Use Change and Forestry Sectors (Agriculture and Land Use, Land-Use Change and Forestry Sectors);
- comparison between Agriculture and Waste Sectors data in the National Greenhouse Gas Inventory and at the level of Food and Agriculture Organization and Eurostat (Agriculture and Waste Sectors).

The QA/QC and verification activities have been enhanced as a result of:

- increased number of NEPA NS/NGHGI dedicated staff;
- training of NEPA and data providers representatives through several training instruments;
- using a cross-checking QC approach within MECC;
- applying on a significantly larger scale sector-specific QC, QA and verification activities;
- their implementation also in the context of development of the NGHGI improvement studies:
  - in 2011,
    - "Elaboration/documentation of national emission factors/other parameters relevant to NGHGI Sectors Energy, Industrial Processes, Agriculture and Waste, values to allow for the higher Tier calculation methods implementation";
    - "NGHGI LULUCF both under the UNFCCC and KP obligations".
  - in 2012,
    - "Determination of emission/removal factors for the forest and for conversions from/to forest land associated pools both under UNFCCC and KP obligations";

- "Compilation of the 2013 National Greenhouse Gas Inventory Land Use, Land-Use Change and Forestry Sector both under the UNFCCC and KP obligations".

❖ in 2013,

- "Elaboration and documentation of the parameters values relevant to the National Greenhouse Gas Inventory Industrial Processes Sector values to allow for the greenhouse gas emissions calculation methods, higher Tier methods, for the categories: Production of halocarbons and sulphur hexafluoride (HFCs, PFCs and SF_6), Consumption of halocarbons and sulphur hexafluoride (actual emissions), Consumption of halocarbons and sulphur hexafluoride (potential emissions)";
- "Determination of the biodegradable content industrial wastes amount and of sludge amount from wastewater treatment, deposited in managed landfills (for the period 1989-2012) and in unmanaged landfills (for the period 1950-2012). Determination of incinerated wastes type/amount and of parameters specific to their incineration, for the period 1989-2012. Wastes incineration N_2O emissions estimation";
- "Determination of emission-removal factors for the pools in forest areas and in areas in conversion from and to forest according with the obligations assumed as a Party to the UNFCCC and to the KP, for the 2014 year reporting";
- "Compilation of the National Greenhouse Gas Inventory Land Use, Land-Use Change and Forestry Sector for the 2014 year associated reporting, according with the obligations assumed as a Party to the UNFCCC and to the KP".

❖ in 2014,

- "Elaboration and documentation of values for the parameters relevant to the National Greenhouse Gas Inventory Sector Industrial Processes and Product Use, values to allow for the implementation of the higher tier greenhouse gas emissions calculation methods for the categories Lime production, Glass production and Ammonia production, according to the IPCC 2006 methodology";
- "Elaboration and documentation of values for the parameters relevant to the National Greenhouse Gas Inventory Sector Industrial Processes and Product

Use, values to allow for the implementation of the higher tier greenhouse gas emissions calculation methods for the category Iron and steel production, according to the IPCC 2006 methodology";

- "Administration of the NGHGI Land Use, Land-Use Change and Forestry Sector (CRF Sector 4), according to the obligations in the United Nations Framework Convention on Climate Change, including those in the Kyoto Protocol".

- continuous consideration of QA, third party support (collaborations with Austria and Netherlands, implementation of the NGHGI improvement related studies, EU internal reviews, review under Article 8 of the KP).

NGHGI improvement plan, is annually updated by the QA/QC coordinator based on the results of the previously mentioned QA/QC and verification checks; the NGHGI improvement plan is linked with the NGHGI preparation plan (attached as Annex 6.1.4) administered by the NGHGI coordinator.

2.1.2.3.5 Treatment of confidentiality issues

Due to the confidentiality clause assigned to some activity data on Industrial Processes activities, also in the Statistical Law context, all specific measures have been taken in this sense.
All aspects pertaining to assuring the data confidentiality are described within the Methodological issues sections of the relevant categories.

2.1.2.4 Changes in the national inventory arrangements and national system since previous annual GHG inventory submission

Changes in the national inventory arrangements and national system are presented in Section 2.3 below.

2.1.3 Inventory preparation, and data collection, processing and storage

2.1.3.1 GHG inventory and KP-LULUCF inventory

The NIR part of the 2015 inventory submission was compiled according to the recommendations for inventories set out in the Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories (FCCC/CP/2013/10/Add. 3) and in the Annotated outline of the National Inventory Report including reporting elements under the Kyoto Protocol and includes detailed information on the inventories for all years from the base year to the year 2013, in order to ensure the transparency of the inventory. The emissions are estimated using the IPCC 2006, Wetlands Supplement and KP Supplement.

According to the Governmental Decision no. 1570/2007 establishing the National System for the estimation of the GHG emissions levels from sources and removals by sinks, as ulteriorly modified and completed, the implementation of the National Inventory Arrangements and National System ensures the NGHGI quality in three phases:

- planning;
- preparation;
- management of the NGHGI preparation activities.

2.1.3.2 Data collection, processing and storage, including for KP-LULUCF inventory

2.1.3.2.1 Data collection

Data collection process comprises the following steps:

- identification of data requirements;
- identification of potential data suppliers;
- preparation of specific questionnaires;
- submitting the questionnaires to the potential suppliers of data;
- data collection;
- data verification: activity data received are examined (time series discrepancies, large

changes in values from the previous to the current inventory year).

Emission factors selection is performed according to the provisions in the MoEO no. 1442/2014 on approving the Procedure on selection of the estimation methods and of the emission factors needed for the estimation of the GHG levels.

A significant amount of activity data and emission factors has been collected/ processed/ developed, enabling the development of higher estimates/tier estimates and the significant decrease of the number of categories characterized using the NE notation key for the majority of Annex A key categories, due to:

- NEPA's/MEWF's work;
- the implementation of dedicated studies:
  - in 2011, "Elaboration/ documentation of national emission factors/other parameters relevant to NGHGI Sectors Energy, Industrial Processes, Agriculture and Waste, values to allow for the higher Tier calculation methods implementation";
  - in 2013, "Elaboration and documentation of the parameters values relevant to the National Greenhouse Gas Inventory Industrial Processes Sector values to allow for the greenhouse gas emissions calculation methods, higher Tier methods, for the categories: Production of halocarbons and sulphur hexafluoride (HFCs, PFCs and SF_6), Consumption of halocarbons and sulphur hexafluoride (actual emissions), Consumption of halocarbons and sulphur hexafluoride (potential emissions)" and "Determination of the biodegradable content industrial wastes amount and of sludge amount from wastewater treatment, deposited in managed landfills (for the period 1989-2012) and in unmanaged landfills (for the period 1950-2012). Determination of incinerated wastes type/amount and of parameters specific to their incineration, for the period 1989-2012. Wastes incineration N_2O emissions estimation";
  - in 2014, "Elaboration and documentation of values for the parameters relevant to the National Greenhouse Gas Inventory Sector Industrial Processes and Product Use, values to allow for the implementation of the higher tier greenhouse gas emissions calculation methods for the categories Lime production, Glass production and Ammonia production, according to the IPCC 2006 methodology" and "Elaboration and documentation of values for the parameters relevant to the National Greenhouse

Gas Inventory Sector Industrial Processes and Product Use, values to allow for the implementation of the higher tier greenhouse gas emissions calculation methods for the category Iron and steel production, according to the IPCC 2006 methodology".

- the implementation of the Protocol of collaboration no. 3136/MMP/9.07.2012 between Ministry of Environment and Forests, NEPA, Romanian Automobile Register and Directorate on Driving Licenses and Vehicles Registration in the Ministry of Administration and Interior.

A significant amount of activity data and emission factors has been collected/ processed/ developed, enabling the development of higher estimates/tier estimates and a significant decrease of the number of categories characterized using the NE notation key for the LULUCF Sector, both under the UNFCCC and KP, through the implementation of:

- the studies:
  - in 2011, "NGHGI LULUCF both under the UNFCCC and KP obligations";
  - in 2012, "Determination of emission/removal factors for the forest and for conversions from/to forest land associated pools both under UNFCCC and KP obligations" and "Compilation of the 2013 National Greenhouse Gas Inventory Land Use, Land-Use Change and Forestry Sector both under the UNFCCC and KP obligations";
  - in 2013, "Determination of emission-removal factors for the pools in forest areas and in areas in conversion from and to forest according with the obligations assumed as a Party to the UNFCCC and to the KP, for the 2014 year reporting" and "Compilation of the National Greenhouse Gas Inventory Land Use, Land-Use Change and Forestry Sector for the 2014 year associated reporting, according with the obligations assumed as a Party to the UNFCCC and to the KP";
  - in 2014, "Administration of the NGHGI Land Use, Land-Use Change and Forestry Sector (CRF Sector 4), according to the obligations in the United Nations Framework Convention on Climate Change, including those in the Kyoto Protocol".
- the Protocol of collaboration no. 3029/MMP-RP/3.07.2012 between Ministry of Environment and Forests, NEPA and ICAS.

Optimizing the informational fluxes on data collection from the operators for the Energy Industries, Manufacturing Industries and Construction categories in the Energy Sector and for the Solid Waste Disposal on Land and Waste Water Handling categories in the Waste Sector was implemented subject to the "Environmental Integrated Informational System" study by the SC Asesoft International SA-SC Team Net International SA-SC Star Storage SRL consortium, based on a contract with NEPA.

2.1.3.2.2 Data processing and emissions/removals calculation

Data processing is done according to the provisions in the Ministry of Environment Order no. 1474/2008 for approving the Procedure on processing, archiving and storage of data specific to the NGHGI. Primary data processing is mostly carried out by MEWF.

Activities were carried out mostly at MEWF, ISPE, ICAS and Denkstat, as contractors of studies:

- in 2011,
  - "Elaboration/documentation of national emission factors/other parameters relevant to NGHGI Sectors Energy, Industrial Processes, Agriculture and Waste, values to allow for the higher Tier calculation methods implementation";
  - "NGHGI LULUCF both under the UNFCCC and KP obligations".
- in 2012,
  - "Determination of emission/removal factors for the forest and for conversions from/to forest land associated pools both under UNFCCC and KP obligations";
  - "Compilation of the 2013 National Greenhouse Gas Inventory Land Use, Land-Use Change and Forestry Sector both under the UNFCCC and KP obligations".
- in 2013,
  - "Elaboration and documentation of the parameters values relevant to the National Greenhouse Gas Inventory Industrial Processes Sector values to allow for the greenhouse gas emissions calculation methods, higher Tier methods, for the categories: Production of halocarbons and sulphur hexafluoride (HFCs, PFCs and SF_6), Consumption of halocarbons and sulphur hexafluoride (actual emissions), Consumption of halocarbons and sulphur hexafluoride (potential emissions)";

- "Determination of the biodegradable content industrial wastes amount and of sludge amount from wastewater treatment, deposited in managed landfills (for the period 1989-2012) and in unmanaged landfills (for the period 1950-2012). Determination of incinerated wastes type/amount and of parameters specific to their incineration, for the period 1989-2012. Wastes incineration N_2O emissions estimation";
- "Determination of emission-removal factors for the pools in forest areas and in areas in conversion from and to forest according with the obligations assumed as a Party to the UNFCCC and to the KP, for the 2014 year reporting";
- "Compilation of the National Greenhouse Gas Inventory Land Use, Land-Use Change and Forestry Sector for the 2014 year associated reporting, according with the obligations assumed as a Party to the UNFCCC and to the KP".

❖ in 2014,

- "Elaboration and documentation of values for the parameters relevant to the National Greenhouse Gas Inventory Sector Industrial Processes and Product Use, values to allow for the implementation of the higher tier greenhouse gas emissions calculation methods for the categories Lime production, Glass production and Ammonia production, according to the IPCC 2006 methodology";
- "Elaboration and documentation of values for the parameters relevant to the National Greenhouse Gas Inventory Sector Industrial Processes and Product Use, values to allow for the implementation of the higher tier greenhouse gas emissions calculation methods for the category Iron and steel production, according to the IPCC 2006 methodology".
- "Administration of the NGHGI Land Use, Land-Use Change and Forestry Sector (CRF Sector 4), according to the obligations in the United Nations Framework Convention on Climate Change, including those in the Kyoto Protocol".

Specific activities comprise:

❖ primary data processing;

❖ check the completeness of all data and information for all years and categories within the analyzed period;

❖ complete the datasets, using also default IPCC interpolation/ extrapolation and/ or

alternative techniques;

- ❖ check the accuracy and consistency of datasets;
- ❖ values transformation in order to reach the measurement unit adequate within the method used;
- ❖ data aggregation/disaggregation considering the IPCC classification;
- ❖ calculation and/or adjustment of different parameters considering the available data.
- ❖ selection of the emission factors and of the methods;
- ❖ application of methods;
- ❖ emissions/removals estimates, using the most recent data;
- ❖ internal review (errors are rectified);
- ❖ preparation of the national inventory report.

Activities previously presented are also implemented within the collaboration between:

- ❖ MEWF, NEPA, Romanian Automobile Register and Directorate on Driving Licenses and Vehicles Registration in the Ministry of Internal Affairs, in the framework of the Protocol of collaboration no. 3136/MMP/9.07.2012, on preparation of Road transport category estimates based on COPERT 4 model;
- ❖ MEWF, NEPA and ICAS, in the framework of the Protocol of collaboration no. 3029/MMP-RP/3.07.2012, on administrating by ICAS of the LULUCF Sector, both under UNFCCC and KP.

2.1.3.2.3 Data archive

Data archiving is done according to the provisions of the Ministry of Environment Order no. 1474/2008 for approving the Procedure on processing, archiving and storage of data specific to the NGHGI.

MEWF team manages and maintains the NGHGI database and the documentation of specific inventory information. According to the provisions in IPCC 2006, the NGHGI documentation includes:

- ❖ assumptions and criteria for selection of AD and EF;
- ❖ EF used, including references to the IPCC documents for default factors or to published references or other documentation for emission factors used in higher tier methods;

- AD or sufficient information to enable activity data to be traced to the referenced source;
- information on the uncertainty associated with AD and EF;
- rationale for choice of methods;
- methods used, including those used to estimate uncertainty;
- changes in data inputs or methods from previous years;
- identification of individuals providing expert judgment for uncertainty estimates and their qualifications to do so;
- details of electronic databases or software used in production of the inventory, including versions, operating manuals, hardware requirements and any other information required to enable their later use;
- worksheets and interim calculations for category estimates and aggregated estimates and any recalculations of previous estimates;
- final inventory report and any analysis of trends from previous years;
- QA/QC plans and outcomes of QA/QC procedures.

All inventory information, as far as needed to reconstruct and interpret inventory data and to describe the national system and its functions, is accessible at a single location at the MEWF's headquarters in Bucharest. While all information officially submitted according to the requirements of the Kyoto Protocol is translated into English, this is not possible for all background information made available during the review process as the official inventory documentation language is Romanian.

Specific NGHGI data are archived as follows:

- electronically – all available documents;
- on paper – the documents used for the NGHGI preparation unavailable in electronic format and the correspondence with different organizations.

In order to ensure the security of databases and the confidentiality of the background data, both paper and electronic data are kept under restricted access conditions. Furthermore, electronic data backup activities are undertaken on MEWF's server with daily frequency during the generation of the official submission and weekly in rest of cases.

Considering the provisions of relevant regulations, MEWF designated the manager of the archiving system.

2.1.4 Brief general description of methodologies and data sources used

2.1.4.1 GHG inventory

Estimation methods selection is done according to the provisions in the MoEO no. 1442/2014 on approving the Procedure on selection of the estimation methods and of the emission factors needed for the estimation of the GHG levels. The emissions from KP Annex A Sectors are estimated following the IPCC 2006. Emissions / removals from LULUCF Sector are estimated using IPCC 2006 and Wetlands Supplement. CORINAIR methodology was applied in case of the solvent use related categories in the NGHGI Industrial Processes and Product Use Sector.
The main data sources used for activity data are presented within the following table.

Table 2.3 Main activity data sources

Sector	Data sources
Energy	National Institute for Statistics - Energy Balance Energy producers Ministry of Economy Romanian Civil Aviation Authority Transgaz SA National Authority on Regulating in Energy National Agency for Mineral Resources
Industrial Processes and Product Use	National Institute for Statistics - Statistical Yearbook and other data sources Industrial operators through 42 Local/Regional Environmental Protection Agencies Direct information from industrial operators
Agriculture	National Institute for Statistics
LULUCF	National Institute for Statistics through Statistical Yearbook Ministry of Agriculture, Forests and Rural Development (MADR) -

Sector	Data sources
	Forests General Directorate (2007-2008); Ministry of Environment and Forests - Forests General Directorate (2009-2011); MECC-Department for Waters, Forests and Fish Farming (2012) National Forest Administration (RNP)
Waste	National Institute for Statistics National Environmental Protection Agency Public Health Institute National Administration "Romanian Waters" Food and Agriculture Organization Landfill operators through 42 Local/Regional Environmental Protection Agencies

A significant amount of activity data and emission factors has been also collected/processed/ developed through:

- the NEPA's/MEWF's work and the implementation by ISPE, ICAS and Denkstat, of the studies:
  - in 2011,
    - "Elaboration/documentation of national emission factors/other parameters relevant to NGHGI Sectors Energy, Industrial Processes, Agriculture and Waste, values to allow for the higher Tier calculation methods implementation";
    - "NGHGI LULUCF both under the UNFCCC and KP obligations".
  - in 2012,
    - "Determination of emission/removal factors for the forest and for conversions from/to forest land associated pools both under UNFCCC and KP obligations";
    - "Compilation of the 2013 National Greenhouse Gas Inventory Land Use, Land-Use Change and Forestry Sector both under the UNFCCC and KP obligations".
  - in 2013,
    - "Elaboration and documentation of the parameters values relevant to the National Greenhouse Gas Inventory Industrial Processes Sector values to allow

for the greenhouse gas emissions calculation methods, higher Tier methods, for the categories: Production of halocarbons and sulphur hexafluoride (HFCs, PFCs and SF_6), Consumption of halocarbons and sulphur hexafluoride (actual emissions), Consumption of halocarbons and sulphur hexafluoride (potential emissions)";

- "Determination of the biodegradable content industrial wastes amount and of sludge amount from wastewater treatment, deposited in managed landfills (for the period 1989-2012) and in unmanaged landfills (for the period 1950-2012). Determination of incinerated wastes type/amount and of parameters specific to their incineration, for the period 1989-2012. Wastes incineration N_2O emissions estimation";
- "Determination of emission-removal factors for the pools in forest areas and in areas in conversion from and to forest according with the obligations assumed as a Party to the UNFCCC and to the KP, for the 2014 year reporting";
- "Compilation of the National Greenhouse Gas Inventory Land Use, Land-Use Change and Forestry Sector for the 2014 year associated reporting, according with the obligations assumed as a Party to the UNFCCC and to the KP".

- in 2014,
  - "Elaboration and documentation of values for the parameters relevant to the National Greenhouse Gas Inventory Sector Industrial Processes and Product Use, values to allow for the implementation of the higher tier greenhouse gas emissions calculation methods for the categories Lime production, Glass production and Ammonia production, according to the IPCC 2006 methodology";
  - "Elaboration and documentation of values for the parameters relevant to the National Greenhouse Gas Inventory Sector Industrial Processes and Product Use, values to allow for the implementation of the higher tier greenhouse gas emissions calculation methods for the category Iron and steel production, according to the IPCC 2006 methodology".
  - "Administration of the NGHGI Land Use, Land-Use Change and Forestry Sector (CRF Sector 4), according to the obligations in the United Nations

Framework Convention on Climate Change, including those in the Kyoto Protocol".

- the implementation of the:
  - Protocol of collaboration no. 3136/MMP/9.07.2012 between Ministry of Environment and Forests, NEPA, Romanian Automobile Register and Directorate on Driving Licenses and Vehicles Registration in the Ministry of Administration and Interior, on the preparation of Road transport category estimates based on COPERT 4 model;
  - Protocol of collaboration no. 3029/MMP-RP/3.07.2012 between Ministry of Environment and Forests, NEPA and ICAS, on administrating the LULUCF Sector, both under the UNFCCC and the KP.

The sources of the emission factors/increment rates used are: national studies, IPCC 2006, Wetlands Supplement, KP Supplement, national research institutes and plants, in a limited number.

Higher estimates/tier estimates and a significant decrease of the number of categories characterized using the NE notation key are available for the majority of Annex A key categories have been achieved, due to:

- NEPA's/MEWF's work;
- the implementation of dedicated studies:
  - in 2011, "Elaboration/ documentation of national emission factors/other parameters relevant to NGHGI Sectors Energy, Industrial Processes, Agriculture and Waste, values to allow for the higher Tier calculation methods implementation";
  - in 2013, "Elaboration and documentation of the parameters values relevant to the National Greenhouse Gas Inventory Industrial Processes Sector values to allow for the greenhouse gas emissions calculation methods, higher Tier methods, for the categories: Production of halocarbons and sulphur hexafluoride (HFCs, PFCs and SF_6), Consumption of halocarbons and sulphur hexafluoride (actual emissions), Consumption of halocarbons and sulphur hexafluoride (potential emissions)";
  - in 2014, "Elaboration and documentation of values for the parameters relevant to the National Greenhouse Gas Inventory Sector Industrial Processes and Product Use, values to allow for the implementation of the higher tier greenhouse gas emissions

calculation methods for the categories Lime production, Glass production and Ammonia production, according to the IPCC 2006 methodology" and "Elaboration and documentation of values for the parameters relevant to the National Greenhouse Gas Inventory Sector Industrial Processes and Product Use, values to allow for the implementation of the higher tier greenhouse gas emissions calculation methods for the category Iron and steel production, according to the IPCC 2006 methodology".

- the implementation of the Protocol of collaboration no. 3136/MMP/9.07.2012 between Ministry of Environment and Forests, NEPA, Romanian Automobile Register and Directorate on Driving Licenses and Vehicles Registration in the Ministry of Administration and Interior.

Higher estimates/tier estimates and a significant decrease of the number of categories characterized using the NE notation key for the LULUCF Sector, both under the UNFCCC and KP, have been achieved through the implementation of:

- the studies:
  - in 2011, "NGHGI LULUCF both under the UNFCCC and KP obligations";
  - in 2012, "Determination of emission/removal factors for the forest and for conversions from/to forest land associated pools both under UNFCCC and KP obligations" and "Compilation of the 2013 National Greenhouse Gas Inventory Land Use, Land-Use Change and Forestry Sector both under the UNFCCC and KP obligations";
  - in 2013, "Determination of emission-removal factors for the pools in forest areas and in areas in conversion from and to forest according with the obligations assumed as a Party to the UNFCCC and to the KP, for the 2014 year reporting" and "Compilation of the National Greenhouse Gas Inventory Land Use, Land-Use Change and Forestry Sector for the 2014 year associated reporting, according with the obligations assumed as a Party to the UNFCCC and to the KP";
  - in 2014, "Administration of the NGHGI Land Use, Land-Use Change and Forestry Sector (CRF Sector 4), according to the obligations in the United Nations Framework Convention on Climate Change, including those in the Kyoto Protocol".

- the Protocol of collaboration no. 3029/MMP-RP/3.07.2012 between Ministry of Environment and Forests, NEPA and ICAS.

Optimizing the informational fluxes on data collection from the operators for the Energy Industries, Manufacturing Industries and Construction categories in the Energy Sector and for the Solid Waste Disposal on Land and Waste Water Handling categories in the Waste Sector was implemented subject to the "Environmental Integrated Informational System" study by the SC Asesoft International SA-SC Team Net International SA-SC Star Storage SRL consortium, based on a contract with NEPA.

2.1.4.2 KP-LULUCF activities

The data relevant to the KP LULUCF activities are presented within the Chapter 11 of the NIR part of the NGHGI 2015.

2.1.5 Brief description of key categories, including KP-LULUCF key categories

2.1.5.1 GHG inventory

The key category analysis has been performed according to the provisions in Chapter 4 in Volume 1 of IPCC 2006, following the Approach 1.

Separate key category analysis were conducted taking into account both the exclusion and inclusion of the LULUCF sector and also both level and trend criteria; all IPCC sectors and categories, sources and sinks (as suggested in Table 4.1 of Volume 1 of IPCC 2006), and gases were analyzed. KCA was conducted for every year of the characterized period.

The results of the key category analysis for 1989 and 2012 are presented in NIR within:

- Chapter 1, at general level;
- Annex 1, using also the guidance and/or template associated with the Tables 7A1-7A3 in IPCC GPG 2000, Tables 5.4.5, 5.4.7 and 5.4.8 of IPCC GPG 2003 and KP-LULUCF CRF Table NIR. 3.

KCA is used for prioritize efforts for improving the quality of the NGHGI-the relevant implemented and future studies referring mainly to the use of higher Tier methods in key categories; the KCA results were considered within activities part of the Romanian inventory improvement plan (including the prioritization plan for moving to higher tier methods for key categories) – 2013-20134 – May 2013.

2.1.5.2 KP-LULUCF activities

The identification of the KP LULUCF key categories followed the procedure described within the Chapter 2 of the KP Supplement.
The data / information relevant to the KP LULUCF activities is presented within the NGHGI 2015 NIR as part of Annex 1 and Chapter 11.

2.1.6 General uncertainty evaluation, including data on the overall uncertainty for the inventory totals

2.1.6.1 GHG inventory

The NIR part of the 2015 inventory submission comprises a full quantitative assessment of the uncertainty. Romania carried out the uncertainty analysis on the basis of Approach 1 according to the provisions in Chapter 3 of Volume 1 of IPCC 2006.
The uncertainty calculation was performed for 2013, both excluding and including the LULUCF sector; it is based on national (NIS, "Elaboration/documentation of national emission factors/other parameters relevant to NGHGI Sectors Energy, Industrial Processes, Agriculture and Waste, values to allow for the higher Tier calculation methods implementation", "Elaboration and documentation of the parameters values relevant to the National Greenhouse Gas Inventory Industrial Processes Sector values to allow for the greenhouse gas emissions calculation methods, higher Tier methods, for the categories: Production of halocarbons and sulphur hexafluoride (HFCs, PFCs and SF_6), Consumption of halocarbons and sulphur hexafluoride (actual emissions), Consumption of halocarbons and sulphur hexafluoride (potential emissions)", "Determination of the biodegradable content industrial wastes amount and of sludge

amount from wastewater treatment, deposited in managed landfills (for the period 1989-2012) and in unmanaged landfills (for the period 1950-2012). Determination of incinerated wastes type / amount and of parameters specific to their incineration, for the 1989-2012 period. Wastes incineration N_2O emissions estimation", "NGHGI LULUCF both under the UNFCCC and KP obligations", "Compilation of the 2013 National Greenhouse Gas Inventory Land Use, Land-Use Change and Forestry Sector both under the UNFCCC and KP obligations", "Determination of emission-removal factors for the pools in forest areas and in areas in conversion from and to forest according with the obligations assumed as a Party to the UNFCCC and to the KP, for the 2014 year reporting" and "Compilation of the National Greenhouse Gas Inventory Land Use, Land-Use Change and Forestry Sector for the 2014 year associated reporting, according with the obligations assumed as a Party to the UNFCCC and to the KP", "Elaboration and documentation of values for the parameters relevant to the National Greenhouse Gas Inventory Sector Industrial Processes and Product Use, values to allow for the implementation of the higher tier greenhouse gas emissions calculation methods for the categories Lime production, Glass production and Ammonia production, according to the IPCC 2006 methodology", "Elaboration and documentation of values for the parameters relevant to the National Greenhouse Gas Inventory Sector Industrial Processes and Product Use, values to allow for the implementation of the higher tier greenhouse gas emissions calculation methods for the category Iron and steel production, according to the IPCC 2006 methodology" and "Administration of the NGHGI Land Use, Land-Use Change and Forestry Sector (CRF Sector 4), according to the obligations in the United Nations Framework Convention on Climate Change, including those in the Kyoto Protocol" studies), study on Romanian uncertainty information and data performed in 2012 by the Environment Agency of Austria-University of Graz consortium (uncertainty data have been collected through interviews, based on the collaboration between "Environmental Integrated Informational System" study contractor, Environment Agency of Austria-University of Graz consortium, data providers and NEPA), and default AD and EFs uncertainty sources;

Considering the 2014 NGHGI and the Tier 1 method:

- the total NGHGI uncertainty for 2012 excluding LULUCF was 17.3%, while including LULUCF was 28.9%;

- the uncertainty introduced into the trend in total national emissions, for 2012, was 2.1% when considering excluding LULUCF criteria and 12.1%, including LULUCF.

Considering the 2015 NGHGI and the Tier 1 method:

- the total NGHGI uncertainty for 2013 excluding LULUCF was 11.6%, while including LULUCF was 28.9%;
- the uncertainty introduced into the trend in total national emissions, for 2013, was 1.3% when considering excluding LULUCF criteria and 10.8%, including LULUCF.

Based on data and information associated with the 2014 NGHGI, a important contribution of LULUCF Sector at the uncertainty data presented in paragraph above can be observed.
The results of the uncertainty analysis are presented within the NIR part of the 2015 inventory submission both at the Uncertainties and time series consistency sub-sectorial sections and in Annex 2 to the NIR.

- uncertainty analysis results are used for prioritize efforts for improving the quality of the NGHGI-in the implementation of progresses, highest priority is attributed to categories having associated high uncertainty level.

2.1.6.2 KP-LULUCF inventory

The data relevant to the KP LULUCF activities are presented within the Chapter 11 of the NIR part of the NGHGI 2015.

2.1.7 General assessment of the completeness

2.1.7.1 GHG inventory

The inventory covers all sectors and all gases in the period 1989-2013 and is complete in terms of geographical coverage. Emissions are presented by sector, by sub-sector and by gas.

All the sources/sinks not estimated or included elsewhere and the relevant justifications are presented in the Annex 5 to the NIR part of the 2015 inventory submission.

2.1.7.2 KP-LULUCF

The data relevant to the KP LULUCF activities are presented within the Chapter 11 of the NIR part of the NGHGI 2015.

2.2 Trends in greenhouse gas emissions

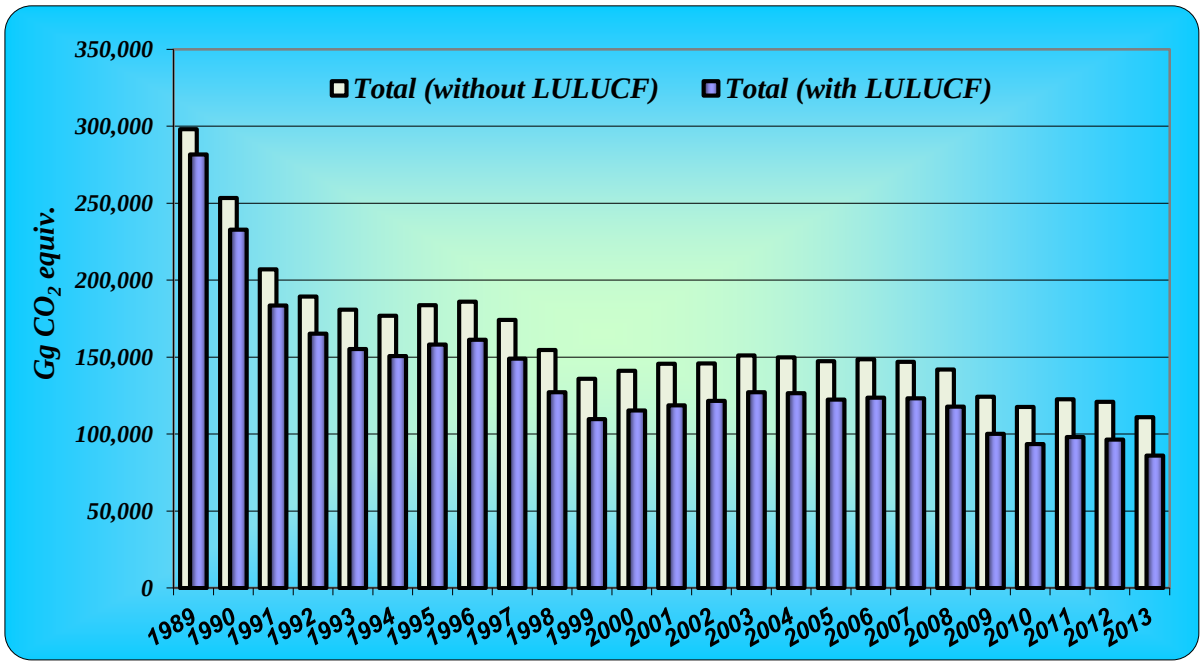
2.2.1 Description and interpretation of emissions trends for aggregated GHG emissions

The total GHG emissions in 2013, excluding removals by sinks, amounted to 73,437.39 kt CO_2 equivalents.

According to the provisions of the Kyoto Protocol, Romania has committed itself to reduce the GHG emissions by 8% in 2008-2012 considering the base year (1989) levels.

The total GHGs emissions (without considering sinks) decreased with 64.85 % in 2013 in comparison to 1989 while the net GHG emissions/ removals (taking into account the CO_2 removals) decreased with 75.03%. Based on these observations, there is a great probability for Romania to meet the commitments to reduce the GHG emissions in the first commitment, 2008-2012.

Figure 2.2 Trends of the aggregated GHG emissions



The emissions trend reflects the changes in this period characterized by a process of transition to a market economy. The emissions trend can be split in three parts: the period 1989-1999, the period 1999-2008 and the year 2010. The decline of economic activities and energy consumption in the period 1989-1992 had directly caused the decrease of the total emissions in that period. With the entire economy in transition, some energy intensive industries reduced their activities and this is reflected in the GHG emissions reduction. Emissions have started to increase until 1996, because of the economy revitalization. Considering the starting of the operation of the first reactor at the Cernavoda nuclear power plant (1996), the emissions decreased again in 1997.

The decrease continued until 1999. The increased trend after 1999 reflects the economic development in the period 1999-2008. The limited decrease of GHG emissions in 2005, compared with 2004 and 2006 levels was caused by the record-breaking hydrological year positively influencing the energy produced in hydropower plants. Due to the economic crisis, the emissions have significantly decreased in 2013 comparing with 2008.

The data on emissions and removals levels associated to the 1989-2013 period are included in the CTF table 1.

2.2.2 Description and interpretation of emissions trends by gas

All GHG emissions, except HFCs and SF_6, decreased comparing with the base year. The shares of GHG emissions have not significantly changed during the period. The largest contributor to total GHG emissions is CO_2, followed by CH_4 and N_2O. In the base year, the shares of GHG emissions were: 70.10% CO_2, 22.42% CH_4, 6.17% N_2O, 1.30% PFCs. In 2013, the shares of GHG emissions were: 66.20% CO_2, 25.88% CH_4, 6.69% N_2O, 0.01% PFCs. The F gases started to be used as substitutes for ODS in refrigerating and air conditioning systems since 1995. In 2013, the contribution of these gases to the total GHG emissions is negligible: 1.17% HFCs and 0.05% SF_6. Next table presents the trend of the aggregated emissions, split by gas.

Table 2.4 Trends by gas [kt CO_2 equivalent]

Year	CO_2 including LULUCF	CO_2 excluding LULUCF	CH_4 excluding LULUCF	N_2O excluding LULUCF	HFCs	PFCs	SF_6
1989	191,753.59	208,913.93	66,817.22	15,890.19	0.16	3,886.75	0.47
1990	151,654.15	173,012.37	62,269.70	13,361.35	0.18	2,455.17	0.47
1991	117,771.23	142,141.46	51,507.86	10,239.34	0.29	2,253.56	0.52
1992	106,525.82	131,631.52	46,125.11	10,777.59	0.45	1,568.98	0.49
1993	97,324.50	123,824.70	43,996.90	10,184.41	0.73	1,635.47	0.52
1994	94,403.24	121,461.49	42,961.24	9,585.09	1.20	1,730.09	0.74
1995	100,884.59	127,358.19	42,912.07	10,307.56	2.53	2,057.96	0.98
1996	105,099.05	130,671.62	42,469.17	9,996.72	4.72	2,052.55	1.54
1997	96,328.24	122,318.21	39,291.64	9,625.41	10.36	2,072.87	1.41
1998	78,136.79	106,360.77	36,798.23	8,433.79	23.88	2,034.53	1.51
1999	62,614.16	89,732.13	35,273.47	8,069.96	39.73	1,860.49	1.70
2000	67,469.24	94,162.78	36,037.50	8,488.26	70.82	1,499.32	8.68
2001	71,619.44	99,503.03	35,489.41	8,255.27	112.87	1,211.66	14.33
2002	74,607.99	99,756.69	36,521.16	7,711.56	168.16	832.99	12.10

Year	CO_2 including LULUCF	CO_2 excluding LULUCF	CH_4 excluding LULUCF	N_2O excluding LULUCF	HFCs	PFCs	SF_6
2003	79,784.65	104,630.32	36,692.55	8,307.59	228.75	304.54	10.54
2004	79,219.03	103,518.23	35,403.70	9,510.76	293.93	153.86	14.10
2005	75,337.47	101,215.34	32,710.85	9,205.29	368.91	95.28	15.67
2006	78,709.39	104,542.71	34,732.03	8,262.69	484.20	64.06	24.13
2007	78,824.93	103,308.98	33,598.89	8,215.14	665.63	28.18	29.88
2008	75,114.93	99,944.59	32,966.01	6,957.18	946.95	17.87	33.83
2009	59,552.78	84,415.70	31,442.70	6,225.70	924.42	8.16	47.03
2010	54,839.99	79,723.02	29,295.78	6,389.55	982.47	9.13	60.71
2011	59,591.21	84,799.78	28,651.17	6,686.99	1,092.41	12.72	47.83
2012	57,918.47	83,182.25	29,292.16	6,068.10	1,197.73	7.43	50.76
2013	47,883.39	73,436.96	28,709.80	6,021.14	1,298.84	6.15	57.08

Carbon dioxide (CO_2) – the most significant anthropogenic greenhouse gas is the carbon dioxide. The decrease of CO_2 emissions (from 208,913.93 kt in 1989 to 73,437.39 kt in 2013) is caused by the decline of the amount of fossil fuels burnt in the energy sector (especially in the public electricity and heat production, and manufacturing industries and constructions sectors) as a consequence of activity decline.

Methane (CH_4) – the methane emissions, related mainly to the Fugitive emissions from fossil fuels extraction and distribution and to the livestock, decreased in 2013 by 57.03% compared with the levels in 1989. The decrease of CH_4 emissions in Agriculture is due to the decrease of the livestock level.

Nitrous oxide (N_2O) – the N_2O emissions are mainly generated within the Agricultural Soils activities in the Agriculture sector and within the Chemical industry activities in the Industrial Processes sector. The decline of these activities (decline of livestock, decline of N synthetic fertilizer applied on soils amounts, decrease of the crop productions level) is reflected in the N_2O

emissions trend. The N_2O emissions in 2013 decreased with 59.67% in comparison with the level in the base year.

Fluorocarbons and SF_6 (HFCs, PFCs, SF_6) – The PFCs emissions generated in the production of the primary aluminium are reported for the entire analyzed period (1989-2013) and have decreased with 99.84% in 2013 comparing with the level in 1989).

2.2.3 Description and interpretation of emissions trends for indirect greenhouse gases and SO_2

The trends of the indirect GHGs are similar with the GHGs trends (Table 2.5), except for CO emissions, which strongly increased staring with 1995, due to the raise of the amount of the firewood used in households.

The NO_x, NMVOC and SO_2 emissions evolution follows the general direct GHG emissions trend. The SO_2 emissions decrease is caused by the decline of the fuels burnt for energy and the decrease of sulphur content in fuels.

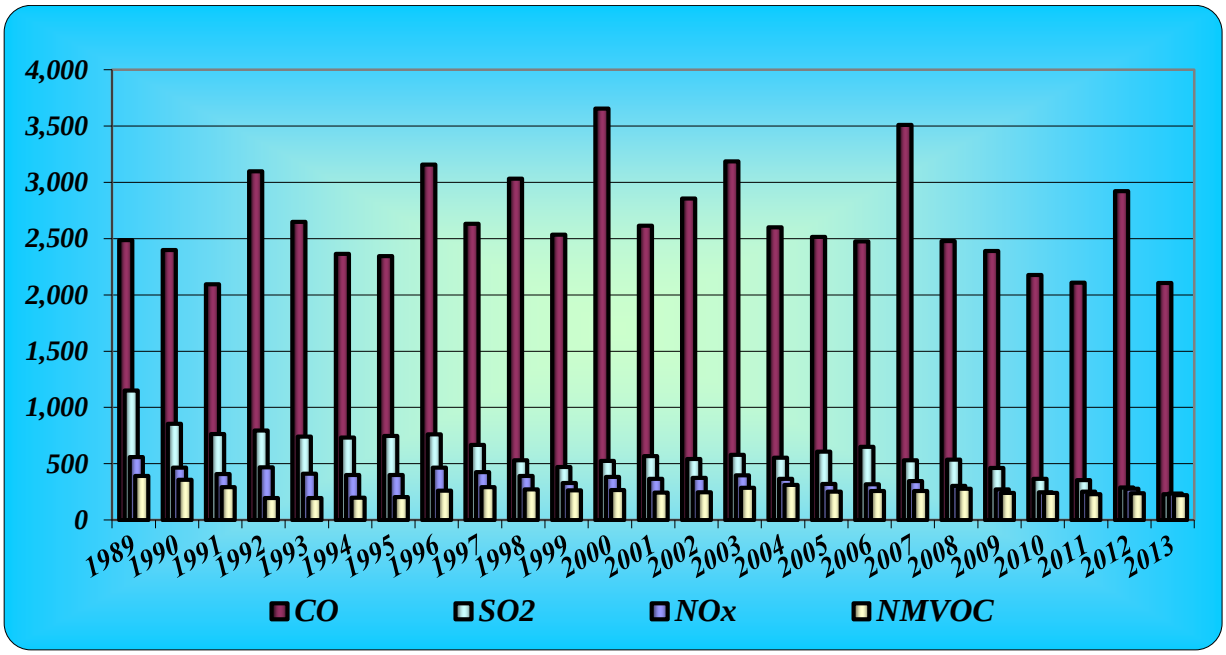
The indirect GHG emissions trends are presented in Figure 2.3.

Table 2.5 Indirect GHG emissions levels [kt]

Year	NO_x	CO	NMVOC	SO_2
1989	559.14	2488.19	390.95	1150.07
1990	466.02	2397.43	356.15	854.03
1991	406.77	2093.54	292.09	764.74
1992	467.48	3099.22	196.21	796.19
1993	411.71	2648.58	194.80	739.73
1994	400.97	2364.37	198.98	731.73
1995	400.38	2345.17	204.35	747.60
1996	464.72	3156.53	261.19	761.46
1997	424.41	2631.19	291.32	665.72

Year	NO_x	CO	NMVOC	SO_2
1998	391.88	3033.17	272.66	531.74
1999	329.75	2536.30	262.52	470.51
2000	381.74	3654.66	265.78	526.01
2001	364.83	2615.00	243.08	567.63
2002	374.93	2857.48	246.45	540.92
2003	396.83	3186.52	284.45	577.54
2004	366.51	2601.16	310.03	551.90
2005	319.61	2515.76	251.96	607.26
2006	317.52	2474.27	256.55	650.90
2007	345.05	3509.52	256.23	529.70
2008	302.89	2477.48	278.51	536.23
2009	271.73	2389.72	239.93	462.41
2010	246.64	2176.75	241.23	365.19
2011	251.76	2108.10	229.25	353.65
2012	275.93	2923.13	236.62	289.74
2013	233.48	2105.65	219.85	229.08

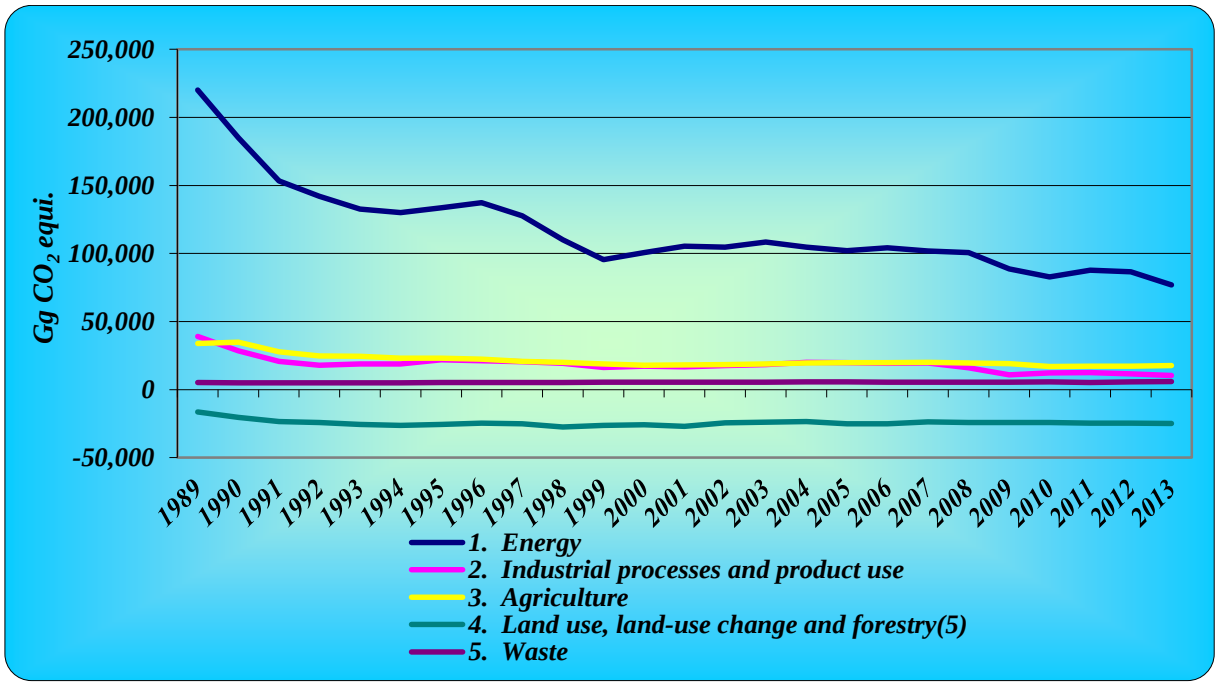
Figure 2.3 Indirect GHG emissions trends [kt]



2.2.4 Description and interpretation of emissions trends by sector

The figure below shows the GHG emissions trends by each sector. The GHG emissions are expressed in kt CO_2 equivalent.

Figure 2.4 Trends by sector



Energy represents the most important sector in Romania. The Energy sector accounted for 69.41% of the total national GHG emissions in 2013. The GHG emissions resulted from the Energy sector decreased with 65.00% compared with the base year.

Industrial processes and product use contributes to total GHG emissions with 9.41%. A significant decrease of GHG emissions was registered in this sector (73.26% decreases in 2013 compared to the level in 1989) due to the decline or the termination of certain production activities.

Agriculture GHG emissions have also decreased. The GHG emissions in 2013 are 47.87% lower in comparison with the 1989 emissions due to:

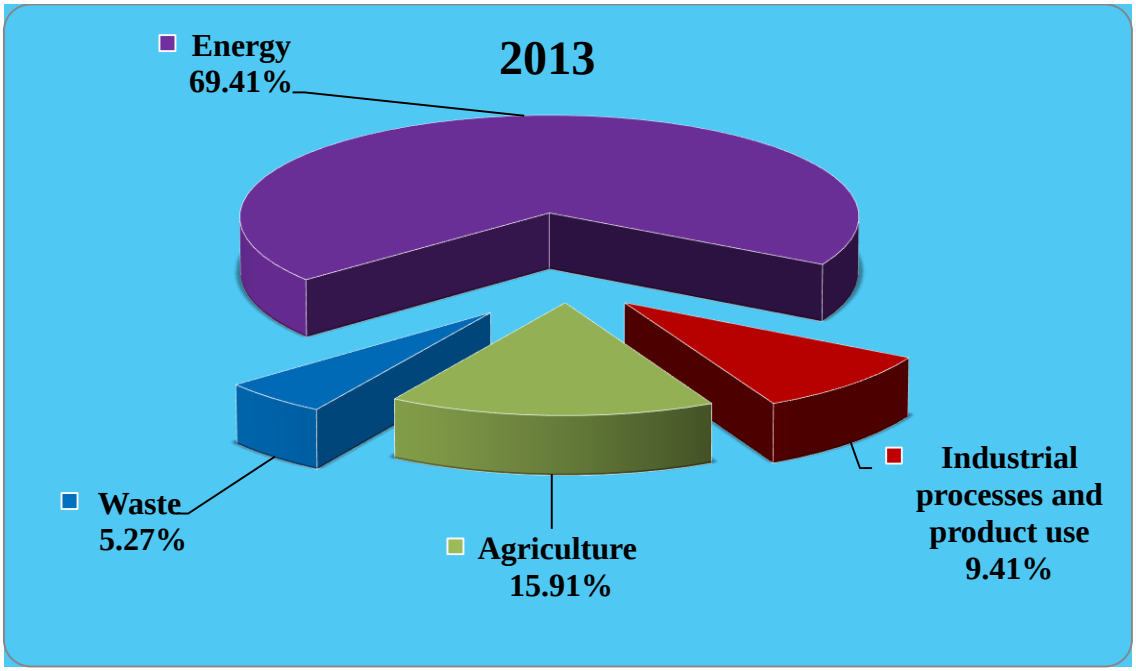
- the decline of livestock;
- the decrease of rice cultivated area;
- the decrease of crop productions level;
- the decline of N synthetic fertilizer applied amounts.

In 2013, 15.91 % of the total GHG emissions resulted from the agriculture sector.

LULUCF The net GHG removals/emissions level is 52.85% higher in 2013 in comparison with the level in the base year.

Waste sector emissions have increased in 2013 with 13.88% in comparison with the level in 1989. The contribution of the waste sector to the total GHG emissions in 2013 is 5.27%.
The participation of sectors to GHG emissions (excluding LULUCF) is presented in the next figure.

Figure 2.5 Sectorial GHG emissions in 2013 [%]



2.2.5 Description and interpretation of emissions trends for KP-LULUCF inventory in aggregate and by activity, and by gas

The data relevant to the KP LULUCF activities are presented within the Chapter 11.

2.3 Information on changes in national system

2.3.1 Description of the National System

The elements on the Romanian NS, according to paragraphs 30 and 31 of Decision 15/CMP. 1, are described within Section 2.1.

2.3.2 Changes in the National System

Changes in the National System performed before the submission of the version 1 of the 2014 NGHGI are presented in Annex 6.8 to the NIR part of the 2015 inventory submission.

2.3.2.1 Changes implemented after submitting the version 1 of the 2014 NGHGI

Changes implemented to the National system for the estimation of anthropogenic greenhouse gas emissions by sources and removals by sinks under Article 5, para. 1 of the Kyoto Protocol comprises:

- the implementation of the studies in 2014, studies presented in Section 2.1, in order to strengthen the NS and to improve the NGHGI, by third party specialized organizations;
- update of the legal acts approving the Procedure on selection of the estimation methods and of the emission factors needed for the estimation of the Greenhouse Gas levels and the Quality Assurance/Quality Control Procedure;
- the change of the title of the national entity with overall responsibility for the national inventory from the Ministry of Environment and Climate Change to the Ministry of Environment, Waters and Forests;
- the QA/QC and verification activities have been enhanced as a result of the implementation of the studies:
    - "Elaboration and documentation of values for the parameters relevant to the National Greenhouse Gas Inventory Sector Industrial Processes and Product Use, values to allow for the implementation of the higher tier greenhouse gas emissions calculation

methods for the categories Lime production, Glass production and Ammonia production, according to the IPCC 2006 methodology";

- "Elaboration and documentation of values for the parameters relevant to the National Greenhouse Gas Inventory Sector Industrial Processes and Product Use, values to allow for the implementation of the higher tier greenhouse gas emissions calculation methods for the category Iron and steel production, according to the IPCC 2006 methodology";
- "Administration of the NGHGI Land Use, Land-Use Change and Forestry Sector (CRF Sector 4), according to the obligations in the United Nations Framework Convention on Climate Change, including those in the Kyoto Protocol".

- continuous consideration of QA, third party support (EU internal reviews, review under Article 8 of the KP);
- KP Annex A sources-ensuring that appropriate methods are used for key categories, improving the inventory accuracy, implementing improvements considering the previous plans and ERT recommendations: based on previously items;
- improvement/further enabling the improvement of the accuracy, completeness and transparency of KP-LULUCF data/information through the implementation of the study "Administration of the NGHGI Land Use, Land-Use Change and Forestry Sector (CRF Sector 4), according to the obligations in the United Nations Framework Convention on Climate Change, including those in the Kyoto Protocol".
- following the government reorganization, 12 posts are available in the National System for Estimating the GHG Emissions Unit–Climate Change General Directorate in the MEWF, exclusively for administrating the NS/NGHGI; the activity continued in an optimal manner, considering also that the attributions and responsibilities have been reallocated to existing personnel;
- generally, as a result of the implementation of the activities above presented, improving the implementation of the NS general functions:
  - ensure sufficient capacity for timely performance of the functions for national systems, including data collection for estimating anthropogenic GHG emissions by sources and removals by sinks and arrangements for technical competence of the staff involved in the inventory development process;

- 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.

- as a result of the implementation of the activities above presented, improving the implementation of the NS specific inventory preparation functions:
  - prepare estimates in accordance with the methods agreed under the KP and ensure that appropriate methods are used to estimate emissions from key source categories;
  - collect sufficient activity data, process information and emission factors as are necessary to support the methods selected for estimating anthropogenic GHG emissions by sources and removals by sinks;
  - compile the national inventory in accordance with Article 7, paragraph 1, and relevant decisions of the COP and/or COP/MOP;
  - implementing the QA/QC and verification procedures in accordance with its QA/QC plan following the IPCC good practice guidance.

Further elements, including on the implementation of studies in 2014, studies presented in Section 2.1, and of the studies presented in Tables of Annex 6.8 to the NIR part of the 2015 inventory submission are presented in Section 2.1 and within the relevant sectorial Sections of the NIR.

2.3.2.2 Steps taken to improve the estimates

In order to improve the Greenhouse Gas estimates, several steps have been performed in order to strengthen the National systems for the estimation of anthropogenic greenhouse gas emissions by sources and removals by sinks under Article 5, para. 1 of the Kyoto Protocol (NS) and to improve the National GHG Inventory (NGHGI), including through the development of studies in 2014, studies presented in Section 2.1.

2.3.3 Elements on strengthening the NS

In order to strengthen the NS the activities described in the Changes in the National System Section in the current Chapter have been implemented.

2.3.3.1 Elements on improving the GHG Inventory

Improvements of the NGHGI comprise:

Progresses incorporated into the 2015 NGHGI

- ***improving the accuracy***
  - applying higher/higher Tier methods for the Lime production, Glass production and Ammonia production categories based on IPCC 2006 methodology ;
  - applying higher Tier methods for the Iron and steel production category based on the IPCC 2006 methodology;
  - applying higher/higher Tier methods in the LULUCF Sector.

- improving the completeness, consistency and transparency of the LULUCF Sector based on the implementation of related study, in 2014, study presented in Section 2.1.

Elements pertaining to the studies administration

The studies implemented in 2014 and presented in Section 2.1 above, and the studies presented within Tables in Annex 6.8 to the NIR part of the 2015 inventory submission have been officially approved by the designated national authority, the Ministry of Environment. The organization having the responsibility of implementing the acquisition procedure pertaining to the studies previously mentioned, including the contracting stage is the Ministry of Environment. In respect to the provisions in the current Improvement Plan, the studies are meant to strengthen the NS and to improve the accuracy of the NGHGI through the use of higher Tier/higher methods according to the specific IPCC good practice guidance decision trees provisions, to

improve its completeness by allowing for the estimation of all relevant emissions/removals, to improve the consistency of the data series and the associated transparency.

The scope of the studies is to provide additional data/information to the Romanian authorities and to optimize the NGHGI related informational fluxes in order to strengthen the compliance with the reporting obligations under the UNFCCC process and the EU monitoring mechanism. The Romanian authority in charge of the GHG emission reporting is the Ministry of Environment and Climate Change, and thus it ensures that the studies are providing adequate information. The results of the studies are providing the necessary data for the NGHGI to fully comply with the IPCC reporting requirements.

According to the specific provisions within the Romanian legislation, namely the Government Decision nr. 1635/2009, the Ministry of Environment and Climate Change is the responsible institution with implementation of UNFCCC and KP. In addition, MEWF is the coordinator of funds distribution for studies in the field of environment and climate change.

MEWF has also the tasks of the implementation of environment policy and legislation, including the entire responsibility regarding the NGHGI.

Therefore, Ministry of Environment is:

- the contracting authority in charge with the promotion of the different studies and is ensuring the elaboration of relevant documentation necessary for the acquirement of these studies, the formal approval of documents as well as with financial disbursement;
- the beneficiary of these studies and use the results to adequately meet the reporting obligations. MEWF is ensuring the development of the Terms of Reference (ToRs) of the studies, including also drawing up the technical aspects of ToRs, in a way to comply with the needs and the provisions of reporting requirements.

Technical verification of the results of studies is also performed by MEWF which use the results in the inventory preparation and hence the interest of MEWF in participating in the process of contracting the best institution to perform the studies in a professional and timely manner.

The quality management from the initiation, throughout the completion of the studies themselves, and the quality assurance of the findings, is ensured as follows:

- ***within the initiation phase*** – when drawing up the relevant ToRs, MEWF as a contracting authority and as the implementing agency is ensuring that the necessary data and

information provided through the studies will support the Romanian authorities to fully comply with the reporting requirements;

The required quality of these studies is assured by the following legal procedure:

- the ToRs for each of these studies are elaborated, using technical elements with the aim to fill the gaps of recent inventory, approved and published by the MEWF;
- the funding is provided by the MEWF;
- the contractor is developing a work plan approved by the beneficiary observing the timeline indicated in ToRs;
- the implementation is carried out in intermediate steps followed by progress reports subject to the approval by MEWF as the main beneficiary of these studies;
- during the implementation phase, the contractor is required to provide MEWF, after the generation of the results, the proper documentation on the scope, methods, assumptions, key parameter values and data sources; further on, MEWF is ensuring the adequate use, archive and storage of the information provided;
- the studies are providing also recommendation for long terms solutions in generating similar information annually.

- ***during the development phase of the studies***

The organizations/entities selected to develop the studies are performing QC activities through all the stages of the study development, are documenting all the activities performed and are providing MEWF the specific documentation including the relevant methodology. In this respect, the contractor is asked to perform and document the QC activities through all stages of the study development and to provide relevant documentation to the beneficiary.

Also, through the contract, the organization elaborating the study is ensuring the implementation of QA activities in the preparation of the respective studies and is providing MEWF with the relevant documentation.

The implementation of the studies is following the classic procedure: inception phase, progress phases and final phase, and thus offering the possibility to MEWF to monitor closely their development and avoiding in this way the deviation from the initial scope of the studies.

- ***within the reception phase***

MEWF is making the payments for the contractor only after MEWF's endorsement of results according to contract. Therefore, the studies are providing quality and useful information for the elaboration of GHG inventories in accordance with reporting requirements.

The entire documentation on the scope, methods, assumptions, key parameter values and data sources for each study is part of the electronic/paper archive stored within the MEWF's headquarters, and are available for using further by experts and checked by review teams.

Giving its legally assigned task and its designation as the responsible authority for the National System and preparation of the National GHG Inventory management, MEWF is responsible for the incorporation within the NGHGI of all studies results immediately after their delivery.

Sufficient funding to strengthen the NS and improve NGHGI including through the development of specific studies are available.

3 QUANTIFIED ECONOMY-WIDE EMISSION REDUCTION TARGET

The EU and its Member States, including also Romania, communicated an independent quantified economy-wide emission reduction target of a 20 per cent emission reduction by 2020 compared with 1990 levels. This is documented in the UNFCCC document FCCC/ SB/ 2011/ INF.1/ Rev.1 of 7 June 2011. In the EU submission to the UNFCCC from 20 March 2012 (FCCC/AWGLCA/2012/MISC.1) the EU target is explained further.
The use of carbon credits from international market-based mechanisms is explained in the EU submission from 2012. With regard to the role of Land Use, Land-Use Change and Forestry (LULUCF), the EU pledge does not include emissions/removals from LULUCF.

Romania's emission reduction target for the years 2013-2020 is part of the joint target of the European Union. The EU quantified economy-wide emission reduction target is implemented through the EU Climate and Energy Package. Key assumptions and conditions related to the EU's target (for example sectors, base year, coverage of gases) are included in the document FCCC/AWGLCA/2012/MISC.1 and under the Second Biennial Report under UNFCCC of EU.

Under the Climate and Energy Package, the EU is committed to reducing its greenhouse gas emissions by 20 per cent by 2020 from the 1990 level. The majority of the reduction will be reached as part of Directive 2003/87/EU- EU emissions trading scheme (EU ETS): in 2020, emissions from sectors covered by the EU ETS will be 21 per cent lower than in 2005.
The Decision no. 406/2009/EC-Effort Sharing Decision established binding annual greenhouse gas emission targets for Member States for the period 2013–2020. These targets concern emissions from sectors not included in the EU ETS such as transport, housing, agriculture and waste. The emissions will be cut by approximately 10 per cent from the 2005 level by 2020 within the EU as a whole. Romania's reduction obligation for the sectors not covered by the EU ETS is +19 per cent. It is up to each Member State to decide how these targets will be achieved, but domestic measures are needed to fulfil the targets. Certified emission reduction units from the clean development mechanism and emission reduction units from joint implementation projects, as well as units transferred from other Member States, can be used to fulfil the targets.

A Member State that fails to meet its annual target will be penalised with an additional 8 per cent emission reduction obligation for the following year.
The Climate and Energy Package also requires Romania to increase its use of renewable energy sources to 24 per cent of final energy consumption by 2020 and the share of biofuels in gasoline and diesel to 10 per cent by 2020.

More information on the EU's Climate and Energy Package can be found: http://ec.europa.eu/ clima/ policies/ package/ index_en.html.

Romania implemented the first commitment period of the Kyoto Protocol to the UNFCCC, 2008-2012, the emissions reduction commitment of 8% in 2008-2012 compared to the base year emissions (1989) being fulfilled.

The description of the Romania's economy-wide emission reduction target is provided below and in the CTF tables 2 (a)-2 (f).

3.1 Base year

The base year of Romania under the United Nations Framework Convention on Climate Change is 1989.

3.2 Gases and sectors covered

The gases covered under the quantified economy-wide emission reduction target are:

- CO_2;
- CH_4;
- N_2O;
- HFCs;
- PFCs;
- SF_6;
- NF_3.

The sectors included in the target are:

- Energy;
- Transport;
- Industrial Processes;
- Agriculture;
- Waste.

3.3 Global warming potential values

The Global Warminig Potential values included in the Fourth Assessment Report elaborated by the Interguvernamental Panel on Climate Change.

3.4 Approach to counting emissions and removals from the land use, land-use change and forestry sector

Emissions and removals from the Land Use, Land-Use Change and Forestry Sector are not included in the quantified economy-wide emission reduction target.

3.5 Use of international market-based mechanisms in achieving its emission reduction target, including a description of each source of international units and/or allowances from market based mechanisms and the possible scale of the contributions of each

Romania does not plan to use market-based mechanisms under the Convention to achieve the target.

3.6 Any other information, including relevant accounting rules

Not applicable.

4 PROGRESS IN ACHIEVEMENT OF QUANTIFIED ECONOMY-WIDE EMISSION REDUCTION TARGET AND RELEVANT INFORMATION

4.1 Mitigation actions and their effects

4.1.1 Information on its mitigation actions, including on the policies and measures

The Romanian Government adopted in 2005 the first National Strategy on Climate Change 2005–2007 and in 2013 the second National Strategy on Climate Change 2013–2020.
The general objective of these strategies focused on two directions:

- Ensuring the meeting of the commitments undertaken by Romania following the ratification of the UNFCCC and of the Kyoto Protocol as well as of the duties on EU climate change;
- Drafting and implementing Romania's voluntary objectives and activities on adapting to the impact of climate change, reducing carbon intensity in the national economy and using the flexible mechanisms stipulated in the Kyoto Protocol in order to increase the competitiveness of Romanian economy.

The National Action Plan on Climate Change had concrete actions for ensuring the meeting of the general and specific objectives of the National Strategy on Climate Change 2013-2020.

4.1.1.1 Policy making process

Decisions related to policies and measures can be taken at different levels: legislative measures at country level, administrative measures at the country, county and municipalities levels.
In accordance with Constitution Act the two chambers of Parliament have legislative power.
The implementation of laws is the domain of the administration, i.e of the ministries and their subordinate administrative units.
Policies and measures with respect to climate change at the municipal level range from land-use planning, public transport and local road construction to public buildings and procurement.

Private business affairs are managed independently.

Ministry of Environment, Waters and Forests operates as a specialized body of the central public administration subordinated to the Government and it performs the national policies correlated with European and international policies on the environment, climate changes, waters, forests, the hunting fund and fish farming, playing the role of state authority for planning, regulation, synthesis, coordination, monitoring, inspection and control. Moreover, it ensures the coordination of the operations on the integration of requirements on environmental protection and climate change in the other sectoral policies in accordance with the European and international requirements and standards.

Ministry of Environment, Waters and Forests has the following responsibilities in the field of climate change:

- ensures the interministerial co-ordination of the process for the elaboration, the revision, the implementation and the monitoring of the National Strategy for Sustainable Development;
- co-ordinates the activity for the integration of the requirements of climate change in the others sectoral policies in concordance with international and European requirements and standards;
- elaborates National Strategy and National Action Plan for Climate Change;
- elaborates National Strategy and National Plan related to the contribution of Romania at the attainment of EU target for reduction of GHG emissions up to 2050;
- ensures the administration National Inventory Arrangements and National System for the estimation of the level of GHG emissions through the annual achievement of National Inventory of GHG emissions;
- ensures the development of an national system for GHG emissions projections in concordance with European stipulations;
- ensures the implementation of the EU emission trade scheme;
- manages the accounts from EU Unique Register of GHG emissions ,which is the jurisdiction of the Romanian State;
- ensures the optimum framework of the implementation for the stipulations of Decision 2009/406/EC on the MS effort to reduce greenhouse gas emissions, so as to observe the Community's commitments to reduce greenhouse gas emissions by 2020;

- ensures the elaboration of national communication of climate change;
- ensures the implementation and the up-to-date of the policies and measures needed for adaptation at negative effect of the climate change;
- ensures the technical secretariat of the National Committee on Climate Change constituted by GD no 658/2006;
- administrates the funds resulted from the transaction of the excess of the quantities attributed for Romania in concordance with Kyoto Protocol and the income obtained through the auction of the GHG emissions certificates.

4.1.1.2 Domestic and regional programmes and/ or legislative arrangements and enforcement and administrative procedures

Romania signed the United Nations Framework Convention on Climate Change (UNFCCC) in 1992. It was ratified by Law no. 24/1994. Thus, Romania has undertaken the commitments stipulated in the respective document.

In 1999, Romania signed the Kyoto Protocol, as the first Part of annex I to the UNFCCC. It was ratified by Law no.3/2001. Thus, Romania undertook the reduction of GHG emissions in the 2008 - 2012 period by 8% compared to the emission value in 1989. Following 1989, the transition from the planned, centralized economy to the free market economy determined an economic decline, following the ending of economic activities in inefficient branches, thus leading to a relevant decrease of the GHG emissions.

In Romania there is a legal framework in the field of climate change which allows for a coherent application of the UNFCCC and the Kyoto Protocol. So there are:

- Primary legislation, including specific acts on climate change;
- General environmental regulations, including climate change aspects;
- Specific legislation related the sectors to energy , transport, agriculture and forestry and waste management.

The Romanian Government adopted in July 2005, through Government Decision no. 645/2005, the first National Strategy on Climate Change (NSCC) 2005 - 2007. The general objective of the strategy focused on two directions:

- Ensuring the meeting of the commitments undertaken by Romania following the ratification of the UNFCCC and of the Kyoto Protocol and of the duties on EU climate change;
- Drafting and implementing Romania's voluntary objectives and activities on adapting to the impact of climate change, reducing carbon intensity in the national economy and using the flexible mechanisms stipulated in the Kyoto Protocol in order to increase the competitiveness of Romanian economy.

The strategy indicates environmental and economic benefits through the implementation of flexible mechanisms and it establishes Romania's approach on the implementation of activities in the field of climate change required for Romania's accession to the EU and for its participation to the EU Emission Trading Scheme (EU ETS).

Therefore, the first steps are taken in the direction of a national effort that is concentrated and coordinated for the implementation of policies in the 2005 - 2007 period for the limitation of GHG emissions and the preparation of measures for adaptation to the potential effects of climate changes. The National Action Plan for Climate Change (NAPCC), approved by GD 1877/2005, published in O.J. 119/2006, was approved in accordance with the NSCC. This plan had concrete actions for the 2005 - 2007 period, ensuring the meeting of the general and specific objectives of the NSCC.

Starting with January 1st, 2007, Romania became an EU Member State with full rights and it obtained significant results by adopting the community aquis. The following Laws and Directives are applied in this context:

- Law no. 104/2011 on environmental quality, aiming to prevent, eliminate, limit the damage and improve air quality, for the avoidance of negative effects on human health and the environment, ensuring the alignment with the international legal norms and with the regulations of the European Union;
- Directive 2008/50/EC – on ambient air quality and cleaner air for Europe;
- Directive 2008/1/EC – concerning integrated pollution prevention and control;
- Directive 2001/81/EC – on national emission ceilings for certain atmospheric pollutants (NEC Directive);

- Directive 2001/80/EC – on the limitation of emissions of certain pollutants into the air from large combustion plants;
- Directive 2010/75/EU – on industrial emissions (integrated pollution prevention and control);
- Directive 1998/70/EC – relating to the quality of petrol and diesel fuels with further amendments and supplements;
- Directive 1994/63/EC – on the control of volatile organic compound (VOC) emissions resulting from the storage of petrol and its distribution from terminals to service stations;
- Directive 1999/13/EC – on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain activities and installations with further amendments and supplements;
- Directive 1998/69/EC – on the measures to be taken against air pollution by emissions from motorized vehicles;
- Directive 2009/29/EC – amending Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community;
- Decision 2009/406/EC on the MS effort to reduce greenhouse gas emissions, so as to observe the Community's commitments to reduce greenhouse gas emissions by 2020;
- Directive 2009/30/EC of the European Parliament and Council of 23 April 2009 amending Directive 98/70/EC on the specifications of petrol and diesel fuels, for the introduction of a greenhouse gas emission monitoring and reduction mechanism and amending Directive 1999/32/EC of the Council relating to a reduction of the sulphur content of certain liquid fuels and amending Directive 93/12/ECC;
- Directive 2009/31/EC on the geological storage of carbon dioxide and amending Directives 85/337/EEC, 96/61/EC, 2000/60/EC, 2001/80/EC, 2004/35/EC, 2006/12/EC and EC Regulation no. 1013/2006;
- (EC) Regulation no. 443/2009 of the European Parliament and Council of 23 April 2009 setting emission performance standards for new passenger cars as part of the Community's integrated approach to reduce CO_2 emissions from light-duty vehicles.

The National Legislation on Climate Change is as follows:

- GD 658/2006 on the reorganization of the National Commission on Climate Change (NCCC) (published in the O.J. 465/.2006);
- GD 780/2006 establishing the greenhouse gas emission allowance trading scheme, amended by GD 133/2010, GD 399/2010, GD 1300/2010;
- GD 60/2008 approving the National allocation plan on greenhouse gas emission allowances for 2007 and 2008-2012;
- GD 48/2013 on the organization and operation of the Ministry of Environment and Climate Change and for the amendment of certain normative acts on the environment and climate change;
- GEO 29/2010 on the capitalization of the surplus units of the quantity awarded to Romania by the Kyoto Protocol, approved by Law 145/2010;
- GEO 115/2011 establishing the institutional framework and the authorization of the Government by the Ministry of Public Finance to auction the greenhouse gas emission allowances awarded to Romania at the European Union level;
- M.O. 1474/2007 approving the Regulation on the management and operation of the national registry of greenhouse gas emissions (published in O.J.680/2007);
- M.O. 1897/2007 approving the procedure on the issuance of the permit for the issuance of greenhouse gas emissions for the 2008-2012 period (published in O.J. 842/2007);
- M.O. 254/2009 approving the Methodology on the allocation of greenhouse gas emission allowances from the New Entrants Reserve, for the 2008-2012 period (published in O.J. 186/2009);
- M.O. 1170/2008 approving the Guide on adaptation to the climate change effects – GACC (published in O.J. 711/2008).

In 2013, Romanian Government approved "National Strategy for Climate Change 2013 - 2020", which approached in two distinct parts the process of the reduction GHG emissions for achieving the national objectives assumed and the process of the adaptation at the effects of the climate change, considering the EU policy related to climate change and the knowledge obtained in the frame of the actions for collaboration with foreign partners and international institutes.
The implementation of this strategy is in the responsibility of the Romanian Government under the co-ordination of the Ministry of Environment and Climate Change.

The revision of the strategy and the up-to date of its objectives will be achieved in 2015 and in 2020 in accordance with the following diagram:

Table 4.1 Diagram of National Strategy on climate change revision and up to date of its objectives

Implementation	2013	2014	2015	2016	2017	2018	2019	2020
Elaboration of Action Plan								
Evaluation of the degree for the achievement of the objectives								
Revision of strategy								

For achieving the GHG emissions reduction objectives up to year 2020, through the applications of EU-ETS and of the objectives defined by Decision no.409/2009/EC, substantial contributions of all economic sectors and all GHG emissions sources are necessary.

The institutional structure, in line with the Memorandum "Action Plan for the implementation of Energy – Climate Change Package in Romania", signed by Romanian Government in year 2009, is necessary to be create and strengthen.

National policy related to the GHG emissions reduction is in line with the EU policy, namely:

- The implementation of the EU-ETS scheme;
- The adoption of the policies and measures at the sectoral level, thus that at national level, the GHG emissions of the sectors must respect the linear trajectory of the levels of the emissions allocated on base of the Decision no.406/2009/EC.

At national level, the limitation and the reduction of the GHG emissions will be achieved through the application of EU-ETS and of the provisions of Decision no 406/2009/EC (for Romania, in 2020, the GHG emissions will increase with 19% in comparison with the emissions level registered in year 2005).

4.1.1.3 Policies and measures and their effects

This section provides information on adopted and planned policies and measures, which contribute to achieve the GHG emissions mitigation goals at EU level and of the Convention taking into consideration the Kyoto Protocol.

The adopted and planned policies and measures took into considerations the GHG emissions of the each sector, theirs potentials of the reductions and the national priorities for economic development.

4.1.1.3.1 Sector Energy

The Romanian Government established the strategic scope for the energy sector in order to meet both the current, medium and long term energy demand, for the lowest possible price, adequate to a modern market economy and to a civilized living standard, under quality and safety in supply conditions, in line with the sustainable development principles.

Considering the role of the energy for the economy and the society, the development of this sector is carried out under state supervision, by drafting and implementing a sectoral strategy, and, on a short term, through the implementation of a policy correlated with the strategic field Romania transposed the following EU Directives into national legislation, with implications on the national primary energy consumption, respectively:

- Directive 2006/32/EC on energy end-use efficiency and energy services - transposed by OG 22/2008 and the Methodological norms for the enforcement of GO 22/2008 approved by GD 409/2009;
- Directive 2005/32/EC establishing a framework for the setting of eco-design requirements for energy-using products - transposed by GD 1043/2007;
- Directive 2009/28/EC on the promotion of the use of energy from renewable sources - transposed by Law no. 220/2008 republished;
- Directive 2004/8/EC on the promotion of cogeneration based on a useful heat demand in the internal energy market - transposed by GD 219/2007;
- Directive 2009/33/EC on the promotion of clean and energy-efficient road transport vehicles – transposed by GEO 40/2011;

- Regulation 2009/443/EC establishing the emission performance standards for new passenger cars – transposed by GD 90/2011;
- Directive 2010/40/EU on the framework for the deployment of ITS in the field of road transport and for interfaces with other modes of transport - transposed by GO 7/1021.

The contribution of Romania at the EU objectives in the frame of the legislative packet "Energy-Climate Change" is the following: "24% of the final energy consumption will be cover by renewable energy resources in 2020".

4.1.1.3.1.1 Electricity and Heat Generation

The primary energy saving measures on the generation of electricity and heating are as follows:

- Withdrawing from service the generating units whose lifespan has been exceeded and which have become obsolete and the replacement thereof with modern units with superior efficiencies;
- Re-engineering 330 MW units operating in lignite-fired power plants;
- Promoting high efficiency cogeneration; gas turbines with a heat recovery boiler (GT + HRB) and a combined cycle with gas turbines (CC + GT) of approximately 1000 MW and 600 MW biomass-fired units shall be installed;
- Continuing the upgrade works of district heating supply systems, respectively the units generating heat fluid, the primary heat fluid (hot water) transmission grid, the heating stations and heating modules, the hot water and heat fluid distribution network;
- Generating electricity from renewable energy sources;
- Distributed electricity generating administrated with modern technology of information.

Beginning with 1 April 2011, the state support scheme for promoting high efficiency cogeneration was applied; the support scheme is in force till 2023.

Based on the National Action Plan for Renewable Energy Sources, which indicates the installed powers per types of technologies from renewable energy sources, results the evolution of energies generated, presented in table 4.2.

Table 4.2 Evolution of electricity generated from Renewable Energy Source [GWh]

	2013	2014	2015	2016	2017	2018	2019	2020
Total generated electricity, of which:	**23,558**	**25,923**	**27,523**	**28,845**	**29,577**	**30,225**	**30,866**	**31,388**
Hydropower plants	17,624	18,191	18,679	18,904	19,063	19,214	19,491	19,768
Photovoltaic power stations	100	140	180	220	246	271	295	320
Wind power plants	4,634	5,952	6,614	7,271	7,668	8020	8,230	8,400
Biomass-fired power plants	1,200	1,640	2,050	2,450	2,600	2,720	2,850	2,900

The main objectives for the utilization of the renewable energy are:

- The integration of renewable energy in the structure of the Romanian Power System;
- The integration of renewable energy in the requirements of the economic efficiency;
- The promotion of the sectoral policy for ensuring the energy security due to the increase share of the renewable energy in final energy consumption, determining lower dependence of imported energy;
- The energy supply for the isolated localities, through utilization of the local energy resources.

4.1.1.3.1.2 Utilization of energy

The energy is used in all economic and social activities. For this reason it is important to use energy in efficient mode with positive impact on the GHG emissions.

The second National Action Plan on Energy Efficiency (PNAEE) for 2011 - 2020 period takes into consideration the sustainable development of Romania and promotes measures for efficient use of energy, in order to achieve the EU commitment (20% reduction in year 2020).

In accordance with National Strategy for Climate Change 2013-2020 resulted that through the elaboration of PNAEE the reduction of GHG emissions in residential sector will be 41.5% in 2020 in comparison with the average value of the period 2001 - 2005.

In this strategy are presented the following specific objectives:

- The improvement of the thermal performance of the buildings. The requirements of the Norm for design and execution of the thermal isolation (C107) will be apply for new residential buildings.

The thermal rehabilitation of the residential buildings will be achieved with two mechanism of finance:

a. 50% from state budget,30% from local budget and 20% from owners fund;
b. A new mechanism for crediting for single family houses and for the mounting of the equipment using renewable energy.

The application of these measures is estimated to determinate an energy economy of about 25%, in comparison with actual situation.

- The encouragement of the development of the projects for ecologic houses, passive houses and /or active houses.
- The modernization of the infrastructure for transport and distribution of heat in centralized system.

  This objective will be achieve also through "The heating 2006-2015 heat and comfort" National Program (GD 462/2006). The period for the implementation of this program will be extended up to 2020. Through the application of this program, the cost with thermal energy for heating, preparing hot water and consumption of the primary energy resources will decrease with about 100,000 toe per year, in comparison with the consumption used for ensuring the thermal energy in year 2004.
- The program for the efficient energy improvement in the building occupied by persons with low income.

  The project "The improvement of energy efficiency in the farm and communities with low incomes from Romania" begun in 2011 for increasing the energy efficiency at 40 buildings (kindergartens, nurseries, health units, asylum for old men etc.) from communities with low income, using local technology (traditional materials) for the reduction of the cost used for fuels.

This project will be extended for the buildings occupied by the persons with low income.

- The program for the encouragement of the consumers for the acquisition of the electrical goods with high energy efficiency, considering the provisions of the Regulation 106/2008/EC;
- The reduction of the water consumption, as a national priority for the following decade, which will determinate a substantial reduction of the energy consumption for water pumping.

The PNAEE foresees the co-finance of several types of projects (increasing the energy efficiency for urban heating, thermal rehabilitation of public building, public lightning).

The application of Ecodesign Directive will lead to the reduction of electricity consumption in services sector and residential sector, due to the use of efficient lighting technologies.

For the Agriculture sector there is a specific objective "The improvement of energy efficiency and the development of the sector for obtaining of energy from renewable resources", achieved by:

- The use of bio - liquid and biomass for obtaining the thermal energy in the farms;
- The implementation of the technologies for collecting and use of the agricultural residues;
- The achievement of the micro installations for obtaining biogas in farms or in groups of farms;
- The introduction of other renewable energies, such us: wind energy, solar energy, geothermal energy;
- The development of the deposits for the agriculture production.

4.1.1.3.2 Industrial Processes and Product Use Sector

4.1.1.3.2.1 Industry

Romanian industry was severely affected by the transition from planned economy to market economy and the loss of existing market within Comecon. In the period 1990-2005 was carried out restructuring and privatization of industrial enterprises, ceasing its business undertakings which had no market or cannot handle compete. After 2008 due to the global economic crisis,

they had ceased undertaking market (metallurgical enterprises, heavy machinery businesses, etc.).

The National Strategy for Sustainable Development (GD no. 1460/2008) provides industrial development policy in accordance with general objectives of the sustainable economic development, in line with EU industrial policies.

The evolution of various industrial sectors in the medium term depends on:

- Maintain and develop an attractive business environment, enhancing investment flows stimulating technological upgrading, renewal processes and products;
- Consider environmental impacts of products throughout their lifecycle (from design, manufacture, assembly, marketing, sale and use to recycling and disposal);
- Support research, development and innovation in conjunction with the real needs of industry and market demand to achieve competitive advantages and reduce the technological gap from advanced countries in the EU;
- Promoting digital technologies at all stages from design to production, marketing management including the management of companies;
- Encourage direct investment as a source of capital, know-how, modern technology and management skills;
- Supporting the emergence of small and medium enterprises (SMEs) in the manufacturing sector, for achieving high quality products with low cost, in line with market requirements.

By applying appropriate tools for economic policy in the period 2008-2030, the resource productivity and energy consumption will increase by an average annual rate of 3-4%, by reducing weights intensive subsectors by upgrading technology and improving management.

After 1990, many new small and medium enterprises (SME) industrial profile appeared.

Considering the EU need for a strong, competitive and innovative industry, competing at international level on excellence basis, the clusters and clusters networks were promoted, as key drivers for innovation and growth through the development of collaborative and multi-sectoral approaches and by stimulating interactions between innovator actors.

Romanian Government will support with public funds the competitiveness of industrial enterprises, the development of high added value products and the production of exported products.

Industrial policy aims to apply the best technologies for improving energy efficiency and providing quality products at competitive prices with environmental compliance. It follows that for the industrial processes sector impose retrofitting and use of new technologies for the efficient processing of raw materials and energy resources leading to reduction of GHG emissions.

4.1.1.3.2.2 Solvents and other products use

Solvents and other products are widely used both in industry (chemical, machinery, wood, etc.), in construction sector, services sector (vehicle maintenance, cleaners, repair phones, etc.) as well as households.

The policy for use of solvents and other products aimed at applying the best technologies for reducing solvents and other products and providing quality products and services at competitive prices with environmental compliance. The new investments will ensure the environmental protection.

4.1.1.3.3 Transport sector

In accordance with the White Paper on Transport 2050, a 20% reduction of GHG emissions is forecast by 2030, compared to 2008, and by 60% in 2050, compared to the level registered in 1990.

The development of the transport system in Romania considers the increase of the inclusion the urban systems in the EU environment, by improving the services (road, railway, sea, river and air transport) with the main destinations in Europe. The relative accessibility indicator (combining services, transhipments, transport prices and durations) shall progressively align, by 2020, to the current indicator for European metropolitan areas.

The general objective of the National Strategy for Sustainable Development is to assure that the transport systems satisfy the economic, social and environmental needs of society, with a minimum impact on the economy, society and environment.

In order to improve behaviour in relation with the environment, the global impact of pollutant emissions generated by the transports sector shall gradually be decreased, in order to meet the objectives established for Romania (national emission ceilings). The emissions will be reduced with 5% by 2015 (case of the cities where air quality emissions limit levels are exceeded), and with 15% (case of the cities where the transports are the main source of pollution).

The national objective for the 2020 time horizon is to meet the current EU average level in terms of the economic, social and environmental efficiency of transports and to perform substantial progresses for the development of the transport infrastructure.

The national objective for the 2030 time horizon is to grow closer to the EU average level of that year in terms of all basic parameters of sustainability in the transport operation.

In May 2011, the Ministry of Transports and Infrastructures in the *Romania Intermodal Transport Strategy – 2020,* underlined the key role of intermodal transport for efficient use of transport means with high capacity (railway, inland waterways and sea transport), with benefit effects on energy consumptions and pollutant emissions (table 4.3).

Table 4.3 Reducing energy consumption and CO_2 emissions by using intermodal transport

Combined transport versus Road transport	**Accompanied combined transport (railing road)**	**Unaccompanied combined transport (containers/trailer cars)**
Reducing energy consumption from the origin to the destination	10%	29%
Reducing energy consumption / km	11%	29%
Reducing CO_2 emissions from the origin to the destination	18%	55%
Reducing CO_2 emissions /km	23%	60%

The general aim of the Intermodal Transport Strategy is the development of the national system for intermodal transport of goods aiming to increase the efficiency of goods transport, with positive impact on environment and on traffic safety in Romania.

In accordance with this strategy, the general target for 2020 is meeting, via this system, of a transport share amounting to at least 40% of the volume of goods carried in intermodal transport units (ITU) on the Romanian territory.

The measures for increasing energy efficiency and reducing pollutant emissions in the transport sector are as follows:

- Using smart transport systems;
- Reducing road transport;
- The program for the renewal of the National car park, funded by the Environmental Fund budget;
- Measures applied by economic agents, local and central public administrative units, holding over 25 vehicles, for monitoring and management of fuels in order to reduce the fuel consumption;
- Upgrading railway cargo and passenger transport by procuring high energy efficiency rolling stock;
- Implementing a tele-management system of electricity and for the compensation of the power factor in electric traction substations;
- Implementing the level 2 European Railway Traffic Management System (ERTMS);
- Reducing the electricity consumption afferent to the generation of compressed air required for the operation of fixed subsystems testing train brakes by replacing old, Reșița type compressors, with modern and efficient equipment;
- Upgrading underground transport by upgrading the electric train park and the public space lighting systems;
- Using biofuels (meeting the bio-fuel usage share amounting to 10% of the final national consumption by 2020);
- Reducing the annual resource consumption by 303 ktoe in the 2014 - 2020 period.
- Promoting “clean passenger cars” and stimulating the manufacturing thereof. In order to encourage the procurement of such passenger vehicles, Emergency Ordinance no. 40/2011 on the promotion of non-polluting and energy-efficient road transport vehicles, amended by Emergency Ordinance no. 9/2013 on the environmental stamp for the passenger vehicle, stipulates the granting of a new environmental ticket for each electric passenger vehicle.

- Encouraging forms of alternative transport (cycling, car-pooling, car-sharing, etc.) through urban planning and the development of an adequate infrastructure for cycling (bicycle tracks, bicycle racks, special bicycle wagons/compartments in the subway and on trains, etc.) and expanding the pedestrian areas, particularly in large urban agglomerations.
- Increasing the degree of using public transportation, by optimizing means of public transport (trains, buses, trolley-buses, trams) and the infrastructure required for the proper operation thereof, expanding the underground network by completing section 1 Mai – Laminorului; carrying out section Drumul Taberei – Universitate - Pantelimon; carrying out section Piaţa Victoriei – Băneasa Airport –Henri Coandă Airport, replacing the park with an expired lifespan (50% of the running park), increasing traffic frequency, as well as equipping the new arteries with trains.

The National Action Plan for the reduction of GHG emissions in civil aviation has the following scopes:

- Improving the efficiency of fuel used, by at least 2%/year (reducing fuel consumption on average by 1.5% per hour of flight);
- Capping CO_2 emissions from civil aviation sector activities, starting with 2020.

Romania, as EU member state, supports the EU vision for a competitive and sustainable transport system through the integration of community objectives into national strategies.
Therefore, in order to meet the 10% renewable share target in the final national energy consumption in transports for 2020, considering the provisions of the Directive 2003/30/EC and Directive 2009/29/EC, transposed in national legislation by GD no. 935/2011 promoting the use of biofuels and bio liquids, the suppliers have the following duties concerning fuels entered on the market:

- Diesel fuel:
  - ✓ 10 Nov. 2011 biofuel content with minimum 5% volume;
  - ✓ 1 Jan. 2013 biofuel content with minimum 6% volume;
  - ✓ 1 Jan. 2015 biofuel content with minimum 7% volume;
- Gasoline:
  - ✓ 10 Nov. 2011 biofuel content with minimum 4% and maximum 5% volume;

- ✓ 1 Jan. 2013 biofuel content with minimum 6% volume;
- ✓ 1 Jan. 2015 biofuel content with minimum 8% volume;
- ✓ 1 Jan. 2017 biofuel content with minimum 9% volume;
- ✓ 1 Jan. 2019 biofuel content with minimum 10% In volume;

In accordance with the provisions of the same decision, the GHG reduction as a result of biofuels usage shall be:

- Minimum 35%, starting with 1 Jan. 2012, or with 1 April 2013 for installations currently in operation;
- Minimum 50%, starting with 1 Jan. 2017;
- Minimum 60%, starting with 1 Jan. 2018, for installations where the production will start on/after 1 Jan. 2017;

The Regulation (EC) no. 443/2009 setting emission performance standards for new passenger cars, as part of the Community's integrated approach to reduce CO_2 emissions from light-duty vehicles, establishes the average value for new vehicles of 130 g CO_2/km, obtained through technological improvement of the vehicles' engine technology. Starting with 2020, the regulation establishes the objective of meeting the average value of 95 g CO_2/km for new vehicle fleet.
Currently, a proposal for amendment of the Regulation (EC) no. 443/2009 is in debate with the Commission, for defining the methods for achieving the 2020 target.

So, according with the Regulation (CE) no. 443/2009, the average CO_2 emission for new vehicles (light-duty vehicles) shall be:

- 130 g CO_2/km in 2012÷2013;
- 95 g CO_2/km in 2020.

The Regulation (EC) no. 510/2011 setting emission performance standards for new light commercial vehicles, as part of the Union's integrated approach to reduce CO_2 emissions from light-duty vehicles, establishes the average value for new vehicles of 175 g CO_2/km, obtained through technological improvement of the vehicles' engine technology. Starting with 2020, the regulation establishes the objective of meeting the average value of 147g CO_2/km for new light-duty utility vehicle fleet.

So, according with the Regulation (EC) no. 510/2011, the average CO_2 emission for new, light-duty vehicles shall be:

- 175 CO_2/km in 2014÷2017;
- 147 g CO_2/km in 2020.

4.1.1.3.4 Agriculture

The National Sustainable Development Strategy of Romania - 2013 – 2020 - 2030 Horizon (GD 1460/2008) emphasizes, in the field of agriculture and food production, on ensuring the safety in supply and the safety of food. Agriculture continues to play an important role in ensuring the incomes of a significant part of the active population. It shall promote a sustainable production model, protecting the ecosystems and ensuring the sustainability of food production, the reduction and elimination of imbalances on the agricultural market, generated by the manner of using natural resources, ensuring an improved capitalization of the advantages held by the Romanian agriculture.

The following national aims are considered within the National Sustainable Development Strategy of Romania for agriculture and forestry:

- *2013 horizon*. Increasing the economic dynamism of rural areas in Romania under the conditions of maintaining social balance through the sustainable development of agriculture, forestry and fishing, including of the afferent processing industries for the optimum satisfaction of the population's food demand and to ensure the conservation and improvement of natural resources.
- *2020 horizon*. Consolidating the structures in the agro-food and forestry field, with the economic and social development of rural areas for the continued reduction of gaps and in order to meet the current average performance level of EU member states; Romania's affirmation as an element of stability for food security in South-Eastern Europe.
- *2030 horizon*. The full adoption of community policies and practices on agriculture, forestry and fishing; completing the restructuring and upgrade of such sectors and of the rural space.

In accordance with this strategy, in the period following 2013, the main aims are:

- Developing the competitiveness of the agricultural sector based on knowledge and private initiative;
- Reducing the population active in the agriculture field, in correlation with increasing reliable farming;
- Reducing the fragmentation degree of agricultural surfaces and stimulating the concentration of small farms;
- Maintaining the quality and diversity of rural and forest space, by following the balance between human activities and the conservation of natural resources.

The National Rural Development Program 2007 - 2013, updated in 2012, grants significant importance to the performances of the agricultural, forestry and food sector. According to this program, the priority directions are:

- Increasing the transformation and upgrade of the dual structure of agriculture in order to increase its competitiveness and to contribute to the economic development and the convergence of incomes from the rural space in parallel with ensuring living conditions and environmental protection in rural areas;
- Maintaining and improving environmental quality in rural areas by promoting sustainable management on agricultural services.

The strategy on the organization of the activity on the national improvement and operation of pastures on a medium and long term, approved by the joint Order 226/2003 of the Ministry of Agriculture, Food and Forests and the Ministry of Public Administration has the fundamental aim to increase the total production of green mass and the quality thereof, in accordance with the increase of economic efficiency of animal operations, particularly of the cattle and sheep livestock.

The specific objectives of this strategy are:

- The quantity increase of the green mass and hay production on the entire surface of pastures and meadows;
- Increasing the nutritional value of the herbaceous carpet, ensuring the balanced and efficient meal of various categories of animals, particularly cattle and sheep, in order to obtain non-polluted zoo technical products and an adequate state of animals health;

- Performing the entire annual demand of legume and perennial grass seeds, specific to the improvement of pasture surfaces;
- Developing scientific research actions related to the generation of new types of plants specific to pastures, the performance of regeneration, fertilization and maintenance works, fighting erosion and excessive moisture, mitigation, works of irrigation on pastures, as well as the efficient use of the green mass and hay production;
- Applying the production technologies specific to natural areas, while also benefitting from the same financing and crediting conditions applied to crops from the crop sector.

Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources was transposed in the Romanian legislation by GD 964/2004, approving the Action plan for the protection of waters against pollution caused by nitrates from agricultural sources. GD 964/2000 stipulates that Romania shall re-examine, revise or supplement at least once every 4 years the list of areas vulnerable to nitrates, appointed to consider the changes and factors resulting from the previous appointment. Therefore, the joint Order 1552/2008 of the Ministry of Environment and Sustainable Development and of the Ministry of Agriculture and Rural Development approves the list of localities per counties where there are sources of nitrates from agricultural activities. Following this approved list, the Inter-ministry Commission for the enforcement of the Action Plan approved the Action Plan for areas vulnerable to nitrates through Decision 21130/DC/14.10 2010. In accordance with this program, the provisions of the Agricultural good practice code for the protection of waters against pollution caused by nitrates from agricultural sources approved by the joint Order 1182/1270/2005 of the Ministry of Environment and Sustainable Development and of the Ministry of Agriculture and Rural Development, are compulsory in areas declared vulnerable to pollution caused by nitrates. The nutrient management plan is carried out under the guidance of the Soil Science and Agro-chemistry Study Offices, based on the nutrient framework management plan that was drafted and made available by the Ministry of Agriculture and Rural Development.

The monitoring of the Action program for vulnerable areas to nitrates from agricultural sources considers the following indicators:

- Monitoring the nitrate content of underground and surface waters (in the points established by the National Administration "Romanian Waters") and ground waters (in the points established by the National Research and Development Institute for Soil Science, Agro-chemistry and Environment);
- The manure storage capacity on individual or collective platforms;
- The compliance period for applying manure on lands;
- The loading of animals per hectare, the technical measures and actions of shepherding arrangements shall be observed on communal pastures;
- The compliance for the protection strips located near surface waters or drinking water captures, in accordance with the Action plan indicators.

It should be emphasized that Romania has an Integrated national system for soil monitoring, surveillance, control and decisions to reduce the share of pollutants resulting from agricultural and management sources of organic residues resulting from animal husbandry services in vulnerable and potentially vulnerable areas to nitrate pollution, within the structures of the National system on the integrated monitoring of water resources and of protected areas, managed by the National Research and Development Institute for Soil Science, Agro-chemistry and Environment.

Romania receives funds through the European Economic Recovery Plan (EERP) in order to comply with the priorities established through the Health Balance of the Common Agricultural Policy (CAP). Such funds shall be used to perform certain measures initiated in the National Strategic Plan, respectively:

- Improving the efficiency in the use of nitrate fertilizers, as well as fertilizer storage to reduce CH_4 and N_2O emissions and to contribute to the mitigation of climate change;
- Stimulating /encouraging the use of equipment for the treatment of waste waters in farming.

4.1.1.3.5 Land Use, Land-Use Change and Forestry Sector (LULUCF)

Please find LULUCF Sector related information in Section 4.1.1.4.2.7.

4.1.1.3.6 Waste Sector

Waste management is one of Romania's current issues. The integrated approach in waste management (waste collection, transport, treatment, reuse and disposal activities), includes the construction of waste disposal installations, together with measures for prevention of waste generation and waste recycling, in accordance with the principles hierarchy: preventing waste generation and the negative impact thereof, waste recovery by recycling, reuse and safety disposal of waste, when recovery is no longer possible.

The responsibility for the waste management activities shall fall with the generators thereof, in accordance with the "polluter pays" principle, or, as appropriate, with the producers, in accordance with the "producer responsibility" principle.

Considerable efforts are required for compliance with the EU legislation on waste management in force, as well as of future requirements.

National, regional and county waste management plans were drafted in order to meet the objectives on waste management.

According with Directive 1999/31/EC on the landfill of waste, Member States shall reduce, by 2016, the volume of stored biodegradable waste at approx. 35%, compared to the level registered in 1995, which shall lead to the significant reduction of methane emissions. Furthermore, methane shall be collected in deposits and, if possible, shall be used for energy generation.

The national legislation on the collection, treatment and storage of municipal waste, in line with the EU directives and decisions is presented in Table 4.4.

Table 4.4 Legislation on the generation, collection, transport, treatment and storage of municipal waste

Directives/ Decisions	National Regulations
Directive no. 2006/12/EC on waste	Law no. 211/2011 on the regime of waste (Official Journal no. 837/25.11. 2011)
	National Strategy on Waste Management and the National Waste Management Plan *(Official Journal no. 954/18.10.2004)*

Directives/ Decisions	National Regulations
	GD 358/2007 amending Annex no. 2 "The National Waste Management Plan" of GD no. 1470/2004 approving the National Waste Management Strategy and the National Waste Management Plan *(Official Journal no. 271/24.04.2007)* MO (Ministry Order) no.951/2007 approving the Methodology on drafting regional and county waste management plans. *(Official Journal no. 497/25.07.2007*)
Directive no. 99/31/EC on the landfill of waste	GD no. 349/2005 on the landfill of waste (Official Journal no.*394 as of 10 May 2005)*
	Order of the Ministry of Environment and Sustainable Development no.757/2004 approving the technical regulations on waste storage (Official Journal no.86, din 26.01.2005), supplemented and amended by Order no. 1230/2005 (Official Journal no.1101 as of 7.12.2005)
Directive no. 94/62/EC on packaging and packaging waste, with further amendments	GD no.621/2005 on packaging and packaging waste (Official Journal no.639 of 20/07/2005) GD no.1872 as of 21 December, 2006 and GD no. 247 as of 27 March 2011, amending and supplementing GD no.621/2005 on the management of packaging and packaging waste
	Law no. 292/2007 (Official Journal no. 758 as of 08.11.2007.), GEO no. 37/2008 (Official Journal no. 336 as of 30.04.2008.), GD no. 25/2008 (Official Journal no. 628/29.08. 2008), Law no. 329/2009 (Official Journal no. 761/9.11.2009) , GEO 15/2010 (Official Journal no. 192/26.03. 2010), Law no. 167/2010 (Official Journal no. 504/20.07. 2010) GEO no. 115/2010 (Official Journal 862/22 December 2010), GEO 71/2011 (Official Journal no. 637/6.09. 2011)
Resolution no. 2000/532/EC, amended by Resolution no. 2001/119 establishing a	GD no. 856 din 16 august, 2002 on the records of waste management and approving the list of wastes, including hazardous waste (Official Journal no. 659 as of 5 September 2002)

Directives/ Decisions	National Regulations
list of wastes*	

Romania committed to implement the EU legislation concerning waste management till the accession date (01.01.2007), with the following derogations on this chapter, included in "Romania's position document Chapter 22 - Environmental protection":

- Directive no. 94/62/EC on packaging and packaging waste - transition period till 2013;
- Directive no. 99/31/EC on the landfill of waste - transition period till 2017;
- Council Directive no. 2000/76/EC on the incineration of waste - transition period till 2009.

The National Development Plan 2007 – 2013 (NDP) also considered the following aims:

- Improving living standards by ensuring the public utility services at the required quality and quantity standards, in the water and waste sectors, by developing the water and waste water infrastructure systems in the concerned localities and creating/consolidating regional related companies, and by developing integrated waste management systems (waste collection, transport, treatment/disposal in the concerned localities; closure non-compliant landfills).
- Improving the environmental management sectorial systems, focus on: the development of specific water and waste management systems, and of natural resource management systems (conservation of biological diversity, ecological reconstruction of damaged systems, prevention and intervention in case of natural risks – particularly floods), as well as on the improvement of the air protection infrastructure.

According with the National Strategy for the Sustainable Development of Romania (2013 – 2020 – 2030), the strategic directions related to the waste management are:

- The rational correlation of the development objectives, including the investment programs, with the capacity of supporting the natural capital;
- Using the best economic and ecologic available technologies, in public fund investment decisions; the firm introduction of eco-efficiency criteria in all production or service activities;

- Forecasting the climate change effects and drafting both long term adaptation solutions, and inter-sectorial contingency measures, including alternative solution portfolios for crisis situations generated by natural and anthropic processes.

4.1.1.3.6.1 Solid waste storage

The following measures are established at EU and national level in order to reduce waste landfill:

- Prioritization of the efforts in the waste management field in line with the waste hierarchy;
- Increasing the recycling rate and improving the quality of recycled materials, working closely with the business sector and companies with the main activity waste recovery;
- Promoting the recovery of packaging waste.

For the biodegradable waste, the total amount of biodegradable waste deposited shall continuously decrease, by:

- Reducing the amount of biodegradable waste to 35% of the total amount, gravimetrically expressed, produced in 1995, until 2016;
- Reducing the amount of biodegradable waste by recycling and processing (minimizing the waste organic material in order to reduce the amount of levigate and biogas from the storage);
- Reducing the amount of paper waste and cardboard for 60% of the total, gravimetrically expressed, produced in 1995, until 2016.

The most important measure to reduce GHG emissions from non-compliant landfills is foreseen by GD 349/2005 regarding the waste disposal, transposing the Directive 99/31/EC regarding the waste disposal, namely: Appendix no. 5 "Calendar of cessation/ termination of service or compliance for the existing landfills – table 5.1 – non-compliant landfills class "b" of the urban area that cease the storage."

According to this calendar, until 2017, 41 non-compliant landfills will have to cease their activity during 2013-2017.

4.1.1.3.6.2 Wastewater treatment

The national policy to reduce GHG emissions, in line with EU legislation, implies the adoption of policies and measures at sector level, for assuring the target established at the national level by the Decision no. 406/2009/EC.

In order to prevent the pollution of surface water with the wastewater from anthropogenic sources, the legislation in force shall be follow. This legislation concerns mainly the quality indicators of the wastewater discharged in the environment.

The basis of the EU legislation in the field of the wastewater is the Directive 91/271/ECC concerning the treatment of the urban wastewater, amended and supplemented by the Directive 98/15/EC. The Directive 91/271/ECC was fully transposed into the Romanian legislation by the GD no. 188/2002 approving some rules concerning the conditions for discharge of wastewater into the aquatic environment, amended and supplemented by the GD no. 352/2005. The GD no. 188/2002 contains the following key annex related to collection, transport, treatment and disposal of wastewater:

- Annex 1. Technical rules for collection, treatment and discharge of urban waste, NTPA – 011;
- Annex 2. Standard on wastewater discharge conditions in the local sewerage networks and direct in treatment plants, NTPA – 002;
- Annex 3. Standard on setting pollutants limits for urban and industrial wastewater discharged into the natural receptors, NTPA – 001.

The main objective of the Directive 91/271/EEC is to protect the environment from the negative effects of the discharges of urban waste and waste water from certain industrial sectors (mainly the processing and manufacturing of the food industry production).

In Romania, the EU legislation in the field of wastewater treatment and discharge into the aquatic environment was implemented during the period 2002-2005, but, further implementation steps are required to fully comply with the requirements of the Directive.

Considering both the location of Romania in the basin of the Danube and the basin of the Black Sea, as well as the necessity to protect the environment in these areas, Romania declared its entire territory as sensitive area. This decision is reflected in the fact that the agglomerations with more than 10.000 equivalent inhabitants should provide an urban wastewater infrastructure to

allow the advanced treatment, especially with regards to the nutrients nitrogen and phosphorus. The secondary treatment (biological level) is a general rule for the agglomerations which are smaller than 10.000 equivalent inhabitants.

The terms of implementation of the Directive vary and depend on the size of the agglomeration and its impact on the receiving waters.

The final transition period for the implementation of the Directive was set on December 31st 2018, with intermediate deadlines for the collection and treatment of the waste water.

The measures to limit and/or reduce GHG emissions arising from the wastewater treatment are the following:

- Increase the degree of connection to the sewerage and waste water services
- Construction of new wastewater treatment plants;
- Rehabilitation and upgrading of the existing wastewater treatment plants;
- Use of modern technology with lower power consumption;
- Automation of the wastewater treatment plants operation, with beneficial implications for their optimal functioning, i.e. avoiding methane emission.

The mitigation actions for all sectors are presented also in the BR CTF table 3.

4.1.1.3.7 Cross-cutting Policies and Measures

An overview of all cross-cutting policies and measures, including the affected sectors is presented in the table below.

Table 4.5 Cross-sectoral policies and measures

Policy and Measure	Sector affected					
	Energy supply	**Energy demand**	**Industry**	**Transport**	**Agriculture and Forestry**	**Waste**
National Action Plan on Efficient Energy	Yes	Yes	Yes	Yes	Yes	
National Action Plan for Renewable Energy	Yes	Linkage			Yes	
Emission Trading Scheme	Yes		Yes			
Promotion for combined heat and power (CHP)	Yes	Linkage	Linkage			
Climate and energy Fund	Yes	Yes				
Eco –Design Directive	Yes	Yes	Likage			
Implementation of biofuels Directive	Linkage			Yes	Yes	
Green Electricity Investment Scheme	Yes	Linkage			Yes	
Water Framework Directive	Yes	Yes	Linkage			

4.1.1.4 Qualitative information regarding the links between the different policies and measures reported and the way such policies and measures contribute to the different projection scenarios including an assessment of their contribution to the achievement of a low-carbon development strategy

4.1.1.4.1 Qualitative information regarding the links between policies and measures reported in online questionnaire and their contribution to the projection scenarios

The links between policies and measures reported and their contribution to the projection scenarios are presented for the WEM scenario in section 4.1.1.4.2 and for the WAM scenario in section 4.1.1.4.3.

4.1.1.4.2 Information on WEM projection scenario

The estimated total effect of implemented and adopted policy and measures (PAMs) till 2035 was calculated for group of policies and measures, as the difference between the GHG emissions in the WOM scenario and WEM scenario. This approach was considered, mainly due to the lack of information related to the effects of individual PAM, the interaction among several PAMs and also difficulty of estimation the effect of multi-sectorial policy.

The multi-sectorial PAMs reported in online questionnaire and included in the WEM scenario were:

- Law no. 278/2013 on industrial emissions, which includes common provisions related to integrated pollution prevention and control and special provisions for large combustion plants, waste incineration/co-incineration plants, installations and activities using organic solvents and installation producing titanium dioxide;
- GD no. 780/2006 establishing the greenhouse gas emission allowance trading scheme (ETS), with further amendments and supplements, applicable for period 2007÷2020;
- Decision no. 406/2009/EC on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2013÷2020, establishing emissions limit at the national level for non–ETS sectors, such us

transport sector, the residential sector, the agricultural sector and the waste sector; the national GHG emissions limit for non-ETS sector in 2020 is +19% compared to 2005 GHG emissions level.

- Law no. 220/2008 on establishing the promotion system for the production of the energy from renewable energy, with further amendments and supplements; the national target in 2020 concerning the share of energy from renewable sources in gross consumption of energy is 24%.

Besides the multi-sectorial PAMs, in order to establish the policy and measures (PAMs) reported in online questionnaire, the development strategies were identified and grouped for each domain. These domains are represented by:

- Energy sector – include combustion in energy industry, manufacturing and construction industry, transport and other sector (services/residential/agriculture/ forestry/fishery);
- Industrial processes;
- Agriculture;
- Land Use, Land Use Change and Forestry;
- Waste.

These framework policies developed in line with EU legislation and defining the main development drivers for a certain time period are presented below.

4.1.1.4.2.1 Energy sector

In accordance with ***Romania's Energy Strategy for 2007÷2020***, approved by GD no. 1069/2007, Romania will follow the achievement of the main energy - environmental objectives of the European Union, objectives that have also been undertaken by Romania.

The energy strategy defines the main development directions of the Romanian electricity system between 2007 and 2020, considering the socio-economic and demographic development, the current situation in the electricity sector and the correlation with the energy-environmental policy of the European Union.

The strategic objective for the energy sector is the meeting of the energy demand, both at present and on a medium and long term, at the lowest possible price, adequate to a modern market

economy and a civilized living standard, under quality and safety in supply conditions, in compliance with the sustainable development principles.

The promotion with priority of the energy efficiency policies and measures is required to ensure the energy need afferent to the development requirements, under sustainability conditions, as an alternative solution to the increase of energy sources.

Moreover, the use of renewable energy sources for the electricity and heating production should be encouraged. Romania is currently on the right track to meet its target on the use of renewable energy sources. In 2012 the percentage of electricity generated from renewable sources reached 23.4%, and the target for 2020 is 24%.

4.1.1.4.2.2 Energy industry

The national energy regulation framework includes norms specific to the electricity and/or heating generation sector, as well as norms regarding the improvement of consumer energy efficiency.

The National Strategy for Sustainable Development in Romania – the 2013 – 2020 – 2030 horizon (NSSD), approved by GD no. 1460/2008, has the main scope the preventing climate change by limiting greenhouse gas emissions, as well as the negative effects thereof on society and the environment.

The national objectives included in the NSSD for the 2020 horizon include:

- Ensuring the efficient and safe operation of the national energy system and the meeting of the current mean level of the EU on energy intensity and efficiency;
- Meeting the obligations undertaken by Romania under the "Energy - Climate change" legislative package and the obligations resulting from the adoption of a new international global agreement in the area;
- Promoting and implementing measures for adaptation to the climate change effects and observing the sustainable development principles.

For the 2030 horizon, the national objective included in the NSSD consists of the alignment to the average performances of the EU on energy and climate change indicators; the fulfillment of

the commitments on the reduction of greenhouse gas emissions in accordance with the existing international and community agreements and the implementation of measures for adaptation to the climate change effects.

The strategic objectives for electricity and heating generation proposed through the **National Strategy on Climate Change (NSCC)** include:

- Development of a sectorial strategy on the reduction of greenhouse gas emissions;
- Capitalization of renewable energy resources;
- Promotion of Smart Systems for electricity production, transmission, distribution and consumption;
- Promotion of high efficiency cogeneration;
- Improvement of energy efficiency;
- Achievement of investments in installations and equipment's for industry companies, generating energy savings;
- Increase of energy efficiency in the Agriculture sector;
- Ecological design;
- Carbon capture and storage in Romania;
- Information campaigns on the importance of increasing energy efficiency for the population and business environment.

Romania's Energy Strategy for 2007÷2020 has the following strategic objectives:

- Energy safety by:
  - ✓ Increasing the energy safety by ensuring the energy resource demand and limiting the dependence on imported energy resources;
  - ✓ Diversifying the import sources and the energy resources by using both nuclear fuel and natural gas, as well as by diversifying the transport routes;
  - ✓ Increasing the performance level of national electricity transmission, natural gas and oil transport networks;
  - ✓ Protecting the critical infrastructure;
- Sustainable development by:
  - ✓ Increasing energy efficiency by using modern technologies;

- ✓ Promoting the production of energy from renewable resources;
- ✓ Promoting the production of electricity and heating in cogeneration plants, particularly in high efficiency cogeneration facilities;
- ✓ Rehabilitation of the electricity and heating transmission and distribution systems, correlated with the rehabilitation of buildings to decrease energy losses and the implementation of new smart buildings;
- ✓ Supporting research-development and applicable research result dissemination activities;
- ✓ The rational and efficient use of primary energy resources;
- ✓ Reducing the negative impact of the energy sector on the environment by promoting zero emission modern technologies.

➢ Competitiveness by:

- ✓ Developing competitive electricity, natural gas, oil, uranium, green certificate, greenhouse gas emission allowance and energy service markets;
- ✓ Liberalizing the energy transit and ensuring constant and non-discriminatory access of participants on the markets to the international transmission, transport, distribution networks and interconnections;
- ✓ Continuing the restructuration and privatization process, particularly on the stock market, in the electricity, heating and natural gas sectors;
- ✓ Resuming the restructuring process for the lignite sector, to increase profitability and access on the capital market.

The National strategy on energy efficiency (NSEE) (GD no. 163/2004) stipulates that the essential scope of the energy efficiency policy is to reduce energy intensity and it estimates a reduction of the value of the above mentioned indicator by 40% between 2004 and 2015.

The strategy exclusively refers to the increase of energy efficiency in the final consumption sectors (industry, the residential sector, the tertiary sector, agriculture, transport), as well as centralized heating supply. The time horizon of the strategy is 2015.

The national energy saving, respectively the energy loss reduction potential is estimated at 27÷35 % of the primary energy resources (industry 20÷25%, buildings 40÷50%, and transport 35÷40%).

The following measures shall be taken to increase energy efficiency in the end use sectors and the meeting of the primary energy consumption reduction targets:

- Continuing the legislative adoption of high energy efficiency norms, increased on the installation of new capacities (whose effect includes a reduction of the energy consumption, amounting to 9.5 million toe);
- Initiating, developing and implementing programs consisting of organizational and institutional measure programs to increase energy efficiency (whose scope is to reduce the 15.9 million toe energy consumption), for all significant energy consumers (consumers with annual consumptions over 1000 toe, local collectives with over 20 thousand inhabitants and administrative buildings with a developed built area over 1500 m2) and in the district heating supply systems.

The main measures ensuring the increase of energy efficiency are:

- Implementing the state aid scheme afferent to high efficiency cogeneration;
- Continuing the "district heating 2006÷2015 heat and comfort" program;
- The obligation of the energy performance certificate for single family housing and flats in the existing buildings that are sold or leased;
- The thermal rehabilitation of buildings;
- The implementation by the central and public authorities of the provisions of art. 9, par. 12 and 13 of law no. 121/2014 on energy efficiency;
- The obligation to enforce the provisions of the European directives and standards on the efficiency of new buildings;
- Continuing the certification of energy auditors both for buildings and for industrial activities;
- Expanding the national energy efficiency program (rehabilitation of the heating system, rehabilitation of public buildings and increasing the efficiency of public lighting) for 2011 – 2015;
- Intensifying the population and business environment information campaigns.

The ***second National Action Plan for Energy Efficiency (NAPEE)*** for 2011÷2020 considers the sustainable development of Romania and it promotes measures contributing to efficient energy use for the meeting of the EU commitment (increase energy efficiency by 20% till 2020).

The primary energy saving measures includes:

- Electricity and heating generation saving measures:
  - ✓ The withdrawal from service of production capacities according to the registered real lifespan and the replacement with high efficiency modern units;
  - ✓ The re-engineering of certain units in the central power plants, according to the technical condition to increase efficiency and expand the operating term, considering the existence of the lignite supply in the country, for competitive prices, for the following 20÷40 years;
  - ✓ The capitalization of local lignite through the implementation of new, modern, coal-fired thermal power units;
  - ✓ The drawing up by the thermal power operators of their own measure programs to increase energy efficiency;
  - ✓ The promotion of high efficiency cogeneration;
  - ✓ Re-engineering/upgrading district heating supply systems;
- Distribution and transport saving measures by:
  - ✓ Reducing electricity transmission network losses by replacing equipment registering high own technological consumption, upgrading obsolete substations and upgrading obsolete lines;
  - ✓ Reducing losses in the electricity distribution networks by upgrading, increase the safety in operation and quality of the services provided to network users, as well as to reduce energy losses;
  - ✓ Reducing heat transport and distribution network losses.

The main objectives for the use of renewable energy are:

- The integration of renewable energy sources in the National Power Grid structure;
- The integration of renewable energy in the economic efficiency requirements;
- The promotion of sectorial policies ensuring energy security by increasing the weight of renewable energies in the energy end use, decreasing the national economy's degree of dependence on primary energy imports;
- Ensuring energy supply in insulated communities by capitalizing the potential of local energy resources.

4.1.1.4.2.3 Transport

The transport activity holds an important role in the support of the economic development of Romania, in close correlation with the energy/fuel consumption and the greenhouse gas emissions.

The evolution of this economic activity sector indicates a significant increase of the number of vehicles registered in Romania. Therefore, it is necessary to adopt the adequate measures leading to the decoupling of GHG emissions in the transport sector in relation to the economic growth, aiming to ensure sustainable development.

The objective in the Transport area is the development of a sustainable system improving social cohesion, access in peripheral areas, the reduction of environmental impact, including the reduction of greenhouse gas emissions, promoting economic competitiveness through the improvement of the infrastructure, ensuring an optimal fuel mix, as well as the use of biofuels from renewable plants and the use of information and communication technology to increase the efficiency of the sector.

The reduction of the CO_2 emissions generated by transport shall be carried out through an integrated, cost-efficient approach, combining innovation in the automobile propulsion technology area and the use of biofuels with the efforts made by the decisional factors and consumers on taking a new attitude in terms of the development of the economic sector.

The technical and financial options, competitiveness and, not lastly, social impact shall be considered in establishing the balance between the demand for mobility and the environmental protection requirements.

The strategic objectives identified in the **National Strategy on Climate Change** for the transport sector include:

- The development of a sectorial strategy on the reduction of greenhouse gas emissions;
- The reduction of emissions afferent to road transfer through the optimization of public means of transport, such as trains, buses, trolleys, trams, the infrastructure required for the adequate efficiency increase of the operation thereof and encouraging alternative forms of transport, such as cycling, car-pooling, car-sharing and other similar options) to represent an attractive alternative to individual motorized transport;

- The reduction of the emissions associated to the road transport of goods by improving and increasing the efficiency of the railway infrastructure and providing incentives to use this form of transport. Moreover, an important role shall be held by the development of the intermodal transport infrastructure;
- The use of low environmental impact vehicles in relation with vehicles equipped with conventional engines using gas or fuel oil;
- The promotion of intelligent transportation systems (its) through the optimal use of traffic and travel road data, the development of traffic and goods management, the assurance of road safety and security and the assurance of the vehicle connection to the transport infrastructure;
- The efficiency increase of railway transport by improving the infrastructure, as well as by using new, low carbon emission technologies;
- The reduction of greenhouse gas emissions in air transport through the inclusion in the eu-ets (since 2012);
- The development of intermodal transport;
- Promoting the use of biofuels through the gradual entry on the market of gas and fuel gas with an established biofuel content;
- Encouraging non-motorized transport and the development of an adequate infrastructure for cycling: bicycle lanes, parking racks, special carts/compartments for bicycles on the subway and trains;
- The stimulation of research and development to reduce greenhouse gas emissions in the transport sector;
- Improving the urban transport performances by moving to an integrated urban development, the variation and improvement of the less polluting forms of transport, the creation and implementation of intelligent transportation systems and increasing the efficiency of the fuel consumption;
- Informing and raising public awareness to facilitate the introduction in this sector of less polluting forms of transport and to limit road transport.

The *general objective* of the ***National Strategy for Sustainable Development in Romania – the 2013 – 2020 – 2030 horizon*** is the assurance by the transportation systems of the economic,

social and environmental needs of society, while also reducing to a minimum of the unwanted impact on the economy, society and the environment.

The global impact of polluting emissions generated by the transport sector shall progressively be decreased, to increase the environmental behavior, so as to meet the objectives set for Romania on the national emission thresholds. A 5% reduction of the current excesses of the limit levels on air quality in cities shall be carried out by 2015, and the proportion shall then increase to 15% for emissions for which transport is the main source of pollution.

The national objective for the 2020 time horizon is to reach the current average level of the EU on the economic, social and environmental efficiency of transport and to carry out substantial progresses in the development of the transport infrastructure.

The national objective for the 2030 time horizon is the approaching of the EU average level in the respective year for all basic sustainability parameters in the transport activity.

The **Strategy on Intermodal Transport in Romania (SIT) – 2020** (May 2011) underlining the fact that the intermodal connection of transports leads to the efficient use of high uptake power modes (railway, inland waterways and sea transport), with benefic effects on energy consumptions and polluting emissions (table 4.6).

Table 4.6 Energy consumption and CO_2 emissions reduction by using intermodal transport

Combined transport versus Road transport	**Accompanied combined transport (motor road)**	**Unaccompanied combined transport (containers/trailers)**
Energy consumption decrease from source to destination	10%	29%
Energy consumption decrease/km	11%	29%
CO_2 emissions decrease from source to destination	18%	55%
Reducing the CO_2 emissions/km	23%	60%

The general objective of the Intermodal Transport Strategy is to develop the national intermodal transport system of goods, to increase the efficiency of goods transport and to improve the environmental impact of transport and on road safety in Romania.
In accordance with this strategy, the general strategy for 2020 is to reach a transport share of at least 40% of the volume of goods carried in intermodal transport units (ITU) on the Romanian territory, through this system.

The increasing energy efficiency measures and the emissions reduction in the transport sector are:

- Use of intelligent transportation systems;
- Reduction of road transport;
- Program on the renewal of the national car park, finance by Environmental Fund budget;
- Measures taken by economic agents and the local and central public administrative units holding over 25 vehicles for the monitoring and management of the fuel consumption for consumption reduction;
- Upgrading railway goods and passenger transport through the procurement of high energy efficiency rolling stock;
- The implementation of an electricity tele-management power factor compensation system for electric traction sub-stations;
- The implementation of the level 2 European Railway Traffic Management System (ERTMS);
- Reducing the electricity consumption afferent to the production of the compressed air required for the operation of the train brake test fixed facilities through the replacement of the old Reșița compressors with efficient, modern equipment;
- Upgrading subway transport by upgrading the electric train park and public lighting systems;
- Using biofuels (reaching the biofuel use share - 10% of the final national consumption, by 2020);
- Decreasing the annual consumption of resources by 303 thousand toe between 2014 and 2020.

- Promoting "clean vehicles" and stimulating the generation thereof. To encourage the procurement of such vehicles, Emergency Ordinance no. 40/2011 promoting non-polluting and energy efficient road transport vehicles, amended by Emergency Ordinance no. 9/2013 on the vehicle environmental stamp, stipulates the granting of a new eco-ticket for each new electric vehicle.
- Promoting alternative transport (cycling, car-pooling, car-sharing, etc.) through urban planning and the development of an adequate cycling infrastructure (bicycle lanes, parking racks, special carts/compartments for bicycles on the subway and trains, etc.) and the expansion of walking areas, particularly in large urban areas.
- Increasing the rate of public transportation use, by optimizing the public transport (trains, buses, trolleys, trams) and the infrastructure required for the adequate operation thereof, expanding the subway network, with the completion of the 1 Mai – Laminorului line; implementing the Drumul Taberei – Universitate - Pantelimon line; implementing the Piaţa Victoriei – Aeroportul Băneasa – Aeroportul Henri Coandă line, replacing the expired lifespan park (50% of the fleet), increasing the traffic frequency, as well as equipping new lines with trains.

The national action plan on the reduction of GHG emissions in the civil aviation area has the following objectives:

- Improving the aviation fuel use efficiency by at least 2%/year (reducing fuel consumption, on average, by 1.5% per hour of flight);
- Capping the CO_2 emissions from activities in the civil aviation sector, starting with 2020.

To meet the target of 10% renewable energy share in the national energy final consumption in transports by 2020, considering the provisions of Directive 2003/30/EC and of Directive 2009/29/EC, transposed nationally by GD no. 935/2011 promoting the use of biofuels and bioliquids, suppliers have the following obligations concerning the fuels placed on the market:

- Diesel:
  - ✓ Nov. 10th, 2011 minimum 5% volume-based biofuel content;
  - ✓ Jan. 1st, 2013 minimum 6% volume-based biofuel content;
  - ✓ Jan. 1st, 2015 minimum 7% volume-based biofuel content;

- Gasoline:
  - ✓ Nov. 10th, 2011 minimum 4% and maximum 5% volume-based biofuel content;
  - ✓ Jan. 1st, 2013 minimum 6% volume-based biofuel content;
  - ✓ Jan. 1st, 2015 minimum 8% volume-based biofuel content;
  - ✓ Jan. 1st, 2017 minimum 9% volume-based biofuel content;
  - ✓ Jan. 1st, 2019 minimum 10% volume-based biofuel content;

In accordance with the provisions of the same decision, the GHG reduction due to the use of biofuels shall be:

- minimum 35%, starting with Jan. 1st, 2012, or starting with April 1st, 2013 for biofuels produced in facilities that are in service;
- minimum 50%, starting with Jan. 1st, 2017;
- minimum 60%, starting with Jan. 1st, 2018, for biofuels produced in facilities where production will start on/following Jan. 1st, 2017.

Regulation (EC) no. 443/2009 setting emission performance standards for new passenger cars as part of the Community's integrated approach to reduce CO_2 emissions from light-duty vehicles sets the average CO_2 emissions generated by new vehicles at 130 g CO_2/km, obtained through the improvement of the vehicle engine technology. Starting with 2020, the regulation establishes the objective of reaching a 95 g CO_2/km emission average for the new vehicle park.
A draft proposal on the amendment of Regulation 443/2009 is currently ongoing debate with the Commission, to define the methods of implementing the objective set for 2020.

Summarizing the provisions of Regulation no. 443/2009, the average CO_2 emission for new (light-duty vehicles) vehicles shall be:

- ✓ 130 gCO_2/km in 2012÷2013;
- ✓ 95 gCO_2/km in 2020.

Regulation (EC) no. 510/2011 establishing the performance standards on emissions for new light-duty utility vehicles, as a part of the Community's integrated approach to decrease CO_2 emissions generated by new light-duty utility vehicles establishes the average CO_2 emission

generated by new vehicles at 175 g CO_2/km, obtained by improving the vehicle motor technology. Starting with 2020, the regulation sets the objective of reaching a average emission at 147 g CO_2/km for the new light-duty utility vehicles.

Summarizing the provisions of Regulation no. 510/2011, the CO_2 average emission for the new light-duty utility vehicles shall be:

- 175 gCO_2/km in 2014÷2017;
- 147 gCO_2/km in 2020.

Romania is currently drawing up the **General Transport Master Plan (GTMP)** for the period up to 2020 and 2030, with a multi-modal approach of modeling and investments in the transport area, to justify interventions in this sector.

The environmental strategic objective of the GTMP is the development of a modern transport infrastructure, considering the environmental effects.

In order to achieve the strategic objective were defines the following specific environmental objectives:

- Promoting transport investment projects contributing to the sustainable transport system performance, with measures to avoid and reduce negative effects, such as air pollution emissions, noise pollution in urban areas and, on heavy traffic routes, water and soil pollution due to diffuse sources, the impact on the landscape and the cultural heritage;
- Reducing greenhouse gas emissions generate from the transport sector;
- Protecting the population’s health by improving environmental and transport safety conditions;
- Decreasing the impact on biodiversity by ensuring measures for the protection and preservation of biodiversity and ensuring the coherence of the national network of natural protected areas.

4.1.1.4.2.4 Other sectors (commercial/ institutional/ residential/ agriculture, forestry, fishery)

Land use is an important instrument for the evolution of society, as it is practically the spatial expression of its economic, social and ecological policies.
The energy intensity of the Romanian residential sector is 8 times higher than that of EU 15, following the inefficiency of district heating and the absence of thermal insulation of most housing/apartments.

In accordance with the **National Strategy on Climate Change 2013÷2020**, it is concluded that, by implementing the NAPEE, the GHG emission reduction in the residential sector shall amount to 41.5% in 2020, compared with 2001÷2005 average value.

The specific objectives included in this strategy:

- Improving the buildings thermal efficiencies.

  The provisions of the Norm on the design and implementation of thermal insulation works (C107) shall apply for new residential buildings.

  It is estimated that, by implementing the measures on the thermal rehabilitation of residential buildings, can be achieved approx. 25% energy saving compared with the current situation.

  The thermal rehabilitation of existing buildings shall be carried out through two financial mechanisms:

  a) 50% from state budget allowances, 30% from the local budget funds and 20% from association of owners' funds.
  b) a new crediting mechanism for single family housing and for the mounting of equipment for the use of renewable energy sources.
- Encouraging the development of projects on eco-houses, passive and/or active houses.
- Upgrading the heating transport and distribution infrastructure in district heating systems.
- The objective shall be implemented through the "District heating 2006÷2015 - heat and comfort program" National Program (GD no. 462/2006). The period for the implementation of this program shall be extended to 2020. The implementation of this

program shall significantly reduce thermal energy costs for heating and consumer hot water preparation, and the consumption of primary energy resources by approx. 100.000 toe/year compared with primary energy resource consumption used to ensure heating for the population in 2004.

- The support program on improving energy efficiency in buildings occupied by low-income persons.
- The "Improving energy efficiency in low-income households and communities in Romania" project was started in 2011 and it aims to increase energy efficiency in 40 buildings (kindergartens, day care centers, dispensaries, nursing homes, etc.) in low-income communities, by using local technologies (traditional materials) to reduce fuel consumption costs.
- The project shall be expanded for buildings occupied by low-income persons.
- The program for encouraging consumers to purchase high energy efficiency electrical equipment and electrical appliances.
- Water consumption reduction. Such a reduction shall be a national priority for the following decade, as it also leads to a substantial reduction of the energy consumption used to pump water.

NAPEE forecasts the co-financing of projects to increase energy efficiency for urban heating, the thermal rehabilitation of public buildings, for public lighting.

The enforcement of the EU regulations established under the "Eco-design" Directive shall lead to the electricity consumption reduction in the service and residential service due to the use of efficient lighting technologies, as well as of efficient equipment.

Measures to reduce energy intensity in the residential sector (energy final consumption in buildings: heating, hot water and lighting), in accordance with the nationally drafted strategies, included in the second NAPEE include:

- Rehabilitation of the envelopment of buildings through measures for the thermal rehabilitation of buildings,
- Granting financial aid for low-income owners for the implementation of rehabilitation works;
- Increasing the efficiency of the existing thermal facilities;

- Increasing the efficiency of lighting systems, the use of low-power lamps;
- Establishing the compulsory requirement to enforce the provisions of the directive and of the European standards on efficiency for new buildings;
- Continuing the metering of heating for end consumers;
- Implementing a national energy education program for the population in schools and the media, on energy saving, environmental protection and the local use of renewable energy resources;
- Stimulating the operation of energy service companies (EMAS).

Measures on energy intensity reduction for the public sector:

- Increase the efficiency and reduce the public lighting consumption;
- Increase the efficiency and reduce the consumption of water supply facilities;
- Energy efficiency increasing in public buildings.

4.1.1.4.2.5 Industrial Processes Sector

It is essential for the drawing up of strategic documents on the development of the Romanian industry to also consider the need for a GHG emission analysis.

The reduction of emissions from Industrial Processes shall mainly be carried out through the enforcement of measures on increasing energy efficiency stipulated in the **NAPEE**, by optimizing technological flows and promoting green technologies.

The strategic objectives identified in the **NSCC** for the industrial processes sector include:

- Development of a sectorial strategy on the greenhouse gases reduction;
- Inclusion of the GHG emission analysis in the standard requirements on the public policies assessment in the economic area during the public policy implementation and post-implementation period;
- Promotion of efficient technologies and clean industries, considering the strong points of Romanian economy;
- Promotion of volunteer agreements contributing to the speeding up of the process on increasing the efficiency of resource consumption in the industry.

Measures on the reduction of energy intensity identified by **NAPEE** for the industry sector include:

- Energy audits and efficient energy management;
- Improving energy efficiency by supporting financing from European union funds;
- Information campaigns;
- Long term volunteer agreements in various sectors of the processing industry.

The **NSSD** specifies that the policy on industrial development concerns the general objectives of sustainable economic development in accordance with the EU industrial policies.

The medium term evolution of different industrial sectors depends on the following aspects:

- Maintaining and developing an attractive business environment, increasing the investment flow, stimulating technological upgrade, and process and product renewal;
- Considering environmental impact of a product on the whole lifecycle (from design, manufacturing, assembly, marketing, sale and use, to recycling and disposal);
- Supporting the research, development and innovation activities in close relation with the real needs of the industry and to the market requirements, to obtain competitive advantages and to reduce the technological gaps compared to advanced eu member states;
- Promoting digital technologies in all stages, from design to production, marketing, including enterprise administration management;
- Encouraging direct investments as a source of capital, know-how, modern technology and management skills;
- Supporting the establishment of small and medium-sized enterprises (smes) in the processing industry sector, for the production of high quality and low cost products, according to the market requirements.

By implementing adequate economic policy instruments between 2008 and 2030, the productivity of the used material and energy resources shall increase by a 3÷4% annual average rate, by reducing the shares of the energy-intensive subsectors, through the upgrade of technologies and management development.

Numerous small and medium-sized enterprises (SMEs) with an industrial profile were established after 1990.

Considering that Europe requires a strong, competitive and innovative industry to be internationally competitive, based on excellence, clusters and cluster networks were promoted, as key factors of innovation and economic growth, through the development of a collaborative and multi-sectoral approach and through the stimulation of interactions between innovative participants.

Through public funds, the Romanian Government shall support the increase of competitiveness in industrial enterprises, the production of high added value products, the production of exported products, and respecting the environmental operating permits.

The industrial policy aims to implement the best technologies to increase energy efficiency and provide quality products for competitive prices, in accord with environmental permits. The result is that **industrial processes** require re-engineering operations and the use of new technologies for the efficient processing of raw material and energy resources, leading to the reduction of GHG emissions.

4.1.1.4.2.6 Agriculture

For Agriculture, the ***NSCC*** has a specific goal consisting of "Improving energy efficiency and developing the sector to acquire energy from renewable resources". The objective is implemented through:

- Use of bioliquids and biomass in the acquirement of heating on the farm;
- Implementation of agricultural crop residue collection and recovery technologies;
- Performance of micro-facilities to acquire biogas on farms or on groups of farms;
- Introduction of other types of renewable energies, such as wind, solar and geothermal energy;
- Development of agricultural production storage facilities.

For the agriculture and food production area, the ***NSSD*** emphasizes the provision of food security and food safety. Agriculture continues to hold an important role in ensuring the revenues of a significant part of the active population. It shall promote a sustainable production model with the production of eco-systems and it shall ensure the sustainability of food safety, the

reduction and removal of unbalances on the agricultural market generated by the way in which natural resources are used, ensuring an improved capitalization of the advantages held by Romanian agriculture.

The following national objectives are considered in the **NSSD** for agriculture and forestry:

- 2020 horizon. The consolidation of structures in the agro-food and forestry area, simultaneous with the economic and social development of rural areas, to continue to reduce gaps and reach the current average performance level of EU member states; establishing Romania as a food supply security stability element in South-Eastern Europe;
- 2030 horizon. The strict adoption of community policies and practices in the agriculture, forestry and fishing area; completing the restructuring and upgrade of such sectors and of the rural area.

According to this strategy, the main objectives in the following period of 2013 are:

- Developing the competitiveness of the agricultural sector based on private knowledge and initiative;
- Reducing the population employed in agriculture, in correlation with increasing reliable holdings;
- Reducing the level of fragmenting agricultural areas and stimulating the concentration of small sized farms;
- Maintaining the quality and diversity of the rural and forestry area, aiming to achieve balance between the human activities and the conservation of natural resources.

In accordance with the second **NAPEE**, the measures on the reduction of energy intensity in the agriculture sector include:

- Increasing efficiency and using biofuels for agricultural vehicles;
- Developing energy crops both for the production of biofuels, and for combined production of energy and heating in cogeneration;
- Increasing the energy efficiency of irrigations.

The 2014÷2020 National Rural Development Program (NRDP) is designed to support Romania's rural development between 2014 and 2020, by strategically approaching the following objectives:

1. increasing the feasibility, upgrade and restructuring of agricultural holdings, particularly of small and medium-sized holdings, rejuvenating the population of farmers, developing the processing sector, and consolidating the market position of agricultural producers;
2. the sustainable management of natural resources and actions against climate change;
3. diversifying economic activities, creating jobs, improving the infrastructure and services to improve life quality in rural areas.

Such priorities are correlated with the nationally defined strategic objectives, with the **Common Agricultural Policy** and with the **Europe 2020 Policy**.

EU Regulation no. 1305/2013 establishes six rural development priorities:

- Encouraging the knowledge transfer and innovation in agriculture and forestry and in rural areas;
- Increasing the holdings feasibility and the competitiveness of all types of agriculture in all regions and promoting innovative agricultural technologies and the sustainable management of forests;
- Promoting the organization of the food chain, including the processing and trading of agricultural products, of animal welfare and the management of agricultural risks;
- The restoration, conservation and consolidation of ecosystems related to agriculture and forestry;
- Promoting the efficient use of resources and supporting the transition to a low carbon emission economy, that is resistant to climate changes in the agricultural, food and forestry sectors;
- Promoting social inclusion, the poverty reduction and economic development in rural areas.

The **Strategy on the medium and long term organization of the pasture improvement and operation at the national** level by the joint Order 226/2003 of the Ministry of Agriculture, Food and Forests and the Ministry of Public Administration has the main goal of increasing the total production of green mass and the quality thereof, while increasing the economic efficiency of livestock farms, particularly of cow and sheep flocks.

The specific objectives of this strategy are:

- Increasing the green mass quantity and hay production on the entire area of pastures and grasslands;
- Increasing the nutritional value of the herbaceous carpet, providing balanced and efficient food for various animals categories included in the cow and sheep species, to obtain non-pollutant zoo-technical products and adequate animal health state;
- Carrying out the entire annual demand of legume and perennial grass seeds, specific to the pasture surfaces improvement;
- Developing scientific research actions concerning the production of new plant varieties specific to pastures, carrying out regeneration, fertilization and maintenance works, fighting erosion and excess humidity, pasture irrigation works, as well as the efficient use of the green mass and grassland production;
- Implementing the production technologies specific to natural areas, while also benefitting from the same financing and credit conditions applied to plant sector crops.

Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources was transposed in the Romanian legislation by GD no. 964/2000 approving the Action plan concerning the protection of waters against pollution caused by nitrates from agricultural sources. GD no. 964/2000 stipulates that Romania shall re-examine, revise or supplement, at least every 4 years, the list of areas vulnerable to nitrates, appointed to consider the changes and factors occurring from the previous appointment. Therefore, the joint Order 1552/2008 of the Ministry of Environment and Sustainable Development and of the Ministry of Agriculture and Rural Development approves the list of localities per counties, where sources of nitrates from agricultural activities have been identified. Following the approved list, the Inter-ministry Commission on the enforcement of the Action Plan on concerning the protection of waters against pollution caused by nitrates from agricultural sources approved the Action program for areas vulnerable to nitrates by Decision 21130/DC/14.10.2010. According to this program, the provisions of the Code of good agricultural practices concerning the protection of waters against pollution caused by nitrates from agricultural sources approved by the joint Order 1182/1270/2005 of the Ministry of Environment and Sustainable Development and of the Ministry of Agriculture and Rural Development are compulsory in areas declared to be vulnerable to nitrate pollution. The nutrient management plan is carried out under the guidance

of the Soil and Agrochemical Study Offices, based on the nutrient framework management plan drawn up and provided by the Ministry of Agriculture and Rural Development.

The Action plan implementation control for areas vulnerable to nitrates from agricultural sources shall consider the following indicators:

- Monitoring the nitrate content of underground and surface waters in the points established by the National Administration "Romanian Waters" and the nitrate content found in soil, in the points established by the National Institute of Research & Development for Soil, Agrochemistry and Environmental Protection;
- The manure storage capacity on individual or collective platforms;
- Observing the manure land application period;
- The animal load per hector, and the technical pasture planning measures and actions are observed on communal pastures;

- Observing the protective strips bordering the surface waters or the drinking water catchments, according to the Action program indicators.

It should be noted that Romania has a **National system on integrated soil management**, **surveillance, control and decisions** to reduce the share of pollutants resulting from agricultural sources and the management of organic waste resulting from zootechnics, in nitrate pollution vulnerable and potentially vulnerable areas, within the structures of the Integrated national system on the monitoring of water resources and protected areas, managed by the National Research & Development Institute for Soil, Agrochemistry and Environmental Protection.

Romania receives funds under the **European Economic Recovery Plan** (EERP) to comply with the priorities established by the **Health Check of the Common Agricultural Policy** (CAP). Such funds shall be used to implement certain measures initiated in the Strategic National Plan, respectively:

- Improving the efficiency of using nitrogen-based fertilizers, as well as of storing fertilizers to reduce CH_4 and N_2O emissions and to contribute to the decrease of climate changes;
- Stimulating/encouraging the equipment use to treat waste waters in agricultural holdings.

4.1.1.4.2.7 Land Use, Land-Use Change and Forestry

The **fundamental objective** of the Romanian forestry sector development strategy is to increase the contribution to the improving of life quality, based on the sustainable management of forests.
The sustainable management of forests is defined by the Romanian legislation to ensure, at this time and in the future, the capacity to exercise multiple ecological, economic and social permanent functions locally, regionally, nationally and globally, without prejudicing other ecosystems. The wording generally defines the climate aspect or the potential contribution to the economic development through reductions or the compensation of de emissions in other economic sectors.
The following actions are required to implement the fundamental objective:

- Updating the institutional framework to carry out the unitary and sustained implementation of the forestry sector development strategy;
- Developing the forestry sector regulatory framework;
  - ✓ Updating the forestry and rural development legislation according to the requirements established by the sustainable management of the national forestry fund;
  - ✓ The harmonization of the national legislation with the EU specific legislation, the international conventions and agreements of which Romania is a signatory party;
  - ✓ Adapting the regulations on the promotion in the sector of the market economy mechanisms and instruments;
  - ✓ The revision and promotion of normative acts on the forestry administration of the national forestry fund through forest districts, irrespective of the nature of the property;
  - ✓ The adaptation of the regulatory framework specific to the wood operation and processing activities, to the environmental protection and conservation requirements and conditions;
  - ✓ Improving the legislative framework to benefit the association of small-sized forest area owners;
  - ✓ Promoting normative acts (through a participative process) by:

- ❖ creating facilities for the forestry land owners, to ensure the stability and the increase of the functional efficiency of forestry ecosystems,
- ❖ the management of protected areas in the forestry fund;

- ✓ Drawing up and promoting financing and compensation - stimulation mechanisms for the activities on the biodiversity conservation and management of protected areas;
- ✓ Promoting norms and regulations specific to economic agents in the forestry sector, required for the performance of efficiency activities;
- ✓ Promoting regulations on the granting of facilities to research beneficiaries and to parties investing in the research & development activity.

The Ministry of Environment and Climate Changes defined the **Forestry development project** whose objective is to maintain and improve the environmentally sustainable management of forests under the State's ownership and under private ownership, so as to also increase the contribution to the national economy and to the rural economies derived from Romanian forestry resources. The project's objective shall be met by implementing the following ***five components*:**

Component 1: *Establishing systems ensuring the sustainable management of forestry lands found under private property by:*

(a) Consolidating the forest department, with emphasis placed on national forestry inspectorates and support services, within the Ministry of Agriculture, Forestry, Water and Environment, to provide extended and consultancy services adequate to the needs of new private forest owners, as well as supervising, regulating and monitoring the sustainable management activities concerning forests on the lands under State property and under private property.

(b) Developing the Association of Private Forest Owners (APPR), by providing basic staff, logistics support and basic office equipment; and by preparing a five-year business development plan, to define the profile of new members and the action plan for recruiting, it shall identify and develop a range of services required for new members, and it shall also include the financing analysis and the cash-flow ensuring the financial sustainability of the APPR national office and the expansion of its new member network. The essential activity of the APPR shall concern the

facilitation of the national and local establishment of associations of private forest owner members, and the support thereof in acquiring financing under the SAPARD program, with funds received from the European Union.

(c) Supporting the establishment of Local Associations of Forest Owners (ALPP) based on the community via support concerning the development of the community in areas experiencing a high level of poverty, where forest lands shall be returned to individual owners, to undivided joint property (co-ownership, rural communities, etc.) and communes (at a village and commune level) that currently have a limited organization capacity; and

(d) Establishing a national system on forestry monitoring and information management (FMIMS) required for supervision and control, to ensure sustainable development and the development of the forestry sector, by providing integrated and updated access to forestry planning, cadastre, legislation, forest and biodiversity inventories, data concerning the forest product circuit, as well as statistics on wood trade and industry.

Component 2: *Decreasing the consequences of the return on the management of forest lands under State ownership by:*

(a) Supporting the National Forestry Authority – Romsilva (NFA) reform and strategic development by preparing and supporting NFA in the implementation of a strategic development plan and funding the role thereof in the management of forests under State ownership. This shall be carried out by:

(i) identifying, totalizing and separating the costs and benefits of public assets benefits and the economic functions of the NFA, as well as by preparing a financial-accounting system ensuring that all activities hold adequate resources;

(ii) performing and assisting in the implementation of a plan on the reform and consolidation of institutional capacity, the improvement of operative and commercial efficiency, thus optimizing the generation of revenues from production forests, while safeguarding public interest and the eco-services provided by the production and protection forests;

(iii) developing a detailed and budgeted action plan, per stages, on the non-fundamental NFA activities both for privatization, and for development, including the supply of management services for the new private sector;

(iv) assisting the NFA in defining the requirements for its information management system, to support its strategic development, and to provide an interactive connection with the national monitoring and information system on forest management, that the project shall establish under the Forestry Directorates;

(v) defining an objective and a process that can be audited to determine the price in wood bids; and

(vi) supplying logistics support materialized in vehicles and equipment required to manage protected forest areas, ongoing definition, with support from the Biodiversity Conservation Management project-ongoing development;

(b) The restoration and widening of the forest road network so as to reduce environmental impact and improve the economic feasibility of wood operation in production forests under State property. Investing in 10 km of new roads and restoring 425 km of old forest roads shall have significant positive impact on the NFA economic performance and shall aid the compensation of high costs occurring following the decrease of the production forest share compared to protection forests. The places where all road sub-projects shall be carried out were selected through an economically, socially and environmentally detailed analysis process, and all new roads, as well as all rehabilitation sub-projects shall be based on the Environmental impact study.

The drawing up of this work also involved a wide consultation of all factors involved in the construction and rehabilitation of forest roads in Romania: non-governmental organizations, NFA – Romsilva, local and central environmental agencies, other agencies responsible for the supervision and endorsement of forest road constructions, as well as companies whose scope includes forest road rehabilitations and constructions.

Component 3: *Supporting the increase of productivity and of competitiveness in the wood industry* by establishing the Forest Sector Business Information Center (ForsBIC), an individual business and consultancy development service, establishing connections and the coordination in the wood industry chain (e.g. forestry, operation, transport, primary and secondary processing),

and it will also provide support to the wood and similar industries, through the analysis and dissemination of information on new technologies, markets and prices, hygiene and export requirements, the promotion of products and brand registration, joint partnership opportunities and the availability of donations and credits, etc.

Component 4: *Building the public support for the sustainable development of forests* by preparing and implementing the public awareness strategy and the campaign oriented towards key factors, including the wide audience, with special emphasis placed on communities living in forest areas; owners deprived of forest; the forest inspectorate staff; NFA; Governmental decision makers; as well as other influential groups, such as the Church and NGOs. The program implementation shall be supported by an inter-ministry committee including the Ministries of Economy and Trade, Education, Water and Environmental Protection, Culture, Tourism and Public Administration. The campaign strategies shall include: media education; the provision of public relations manuals for the forestry inspectorate staff, the preparation of promotional and educational materials to be used in schools; the organization of local educational events; the involvement of environmental NGOs in educational projects, as well as supporting the Project Implementation Unit to develop its own public relation capacity and the information of key decision makers of the project's implementation stage. The public awareness campaign shall involve regular assessments of the perception of the involved factors; they shall be used to refine the campaign according to the needs for change.

Component 5: *The project management and monitoring* shall be made by the Biodiversity Conservation Management Project Management Unit (PMU), consisting of the project manager, two specialists (for forest roads, respectively for public awareness), an acquisition specialist, a second acquisition specialist, for the acquisition activity afferent to the construction and the rehabilitation of the forest road network, and an administrative assistant. The ECP shall supervise and support the implementation of all program activities in accordance with the agreed indicators.

4.1.1.4.2.8 Eco-reconstruction

The main scope of the forest ecological reconstruction, through the forestation of degraded lands that are unfit for agricultural use, as well as of non-productive lands, irrespective of the form of ownership is soil protection, the restoration of hydrological balance and the improvement of environmental conditions.

Lands that, through erosion, pollution or the destructive action of anthropogenic factors have finally lost their agricultural production capacity, however that can be improved through forestation are deemed degraded lands. The following categories of lands are deemed degraded:

- lands with very strong and excessive surface erosion;
- lands with deep erosion – basins, ravines, torrents;
- lands impacted by active slides, mass slides, landslides and mudslides;
- sandy lands exposed to wind and water erosion;
- lands with gravel, boulder, debris, rock agglomeration and torrential deposits;
- lands with a permanent humidity excess;
- salt or strongly acidic lands;
- lands polluted with chemicals, oil or pollutant substances;
- lands occupied with mining tailings, industrial or household waste, borrow pits;
- lands with impacted or destroyed biota;
- non-productive lands.

Degraded lands that can be improved through forestation shall be established in improvement area. The inventory of degraded lands is a permanent obligation that shall only end following the conclusions of the improvement actions thereof.

The National Forestation Program implemented in 2010 considers the expansion of forest areas to decrease the impact of climate changes and the risk of desertification, the risk of floods and landslides, of storage lake clogging, etc.

Between 2013 and 2016, 75,000 ha shall be forested, as follows:

- 4000 ha degraded lands taken over by NFA - Romsilva from State Domain Agency (SDA) and purchased;
- 4000 ha degraded lands held by individuals and local councils;

- 40,000 ha degraded agricultural lands held by owners' associations, administrative-territorial units, units of education, cultural units;
- 2300 ha protection forest belts.

Between 2017 and 2020, 60,000 ha shall be forested, as follows:

- 8,000 ha degraded lands taken over by NFA - Romsilva from SDA and purchased;
- 8,000 ha degraded lands held by individuals and local councils;
- 40,000 ha degraded agricultural lands held by owners' associations, administrative-territorial units, units of education, cultural units;
- 4000 ha protection forest belts.

Between 2021 and 2030, 158,000 ha land shall be forested.

Increasing areas occupies by forest between 2013 and 2030 by 293,000 ha shall involve financial effort that shall be covered by the state budget, from the Fund for the improvement of lands intended for forestry use, external funds stipulated under measure 221 of the National Plan on Rural Development, the Environment Fund.

The following shall be emphasized within the **National Strategy on Sustainable Development:**

- Improving the methods on the use of conservative forest and agricultural lands
  a) Promoting technologies on the conservation and increase of Carbon in arable soils;
  b) The regional planning of the resources resulting from land use;
  c) Implementing the green economy principles on a national scale.
- The improved use of forest resources and wood:
  a) Supporting the private sector for the biomass production and the energy – resource integration.
- National and European Union policies and programs:
  a) Promoting integrated land arrangement;
  b) Promoting inter-sectoral integrated policies (energy – resources);
  c) Support on interdisciplinary research funded from national programs on the support of national policies (or ongoing national and international negotiation).

4.1.1.4.2.9 Waste Sector

4.1.1.4.2.9.1 Waste Management

Based on the continuous decrease and degradation of natural resources, as well as on the need to conserve them (mainly biological resources), the re-assessment of the anthropogenic origin waste management options is required, concerning the increase of the recovery level thereof and the drastic reduction of the quantities requiring disposal.

Judicious waste management is a mean to identify, totalize and assess eco -systemic services, to adopt the best decisions on environmental preservation, conservation and management, and, therefore, a means of GHG emission reduction.

By analyzing the waste management measures included in the waste management plans and strategies in force and promoted nationally, the ***NSCC*** identifies the following strategic objectives:

- Developing a sectorial strategy on the reduction of greenhouse gases;
- Preventing waste production through the inclusion in the list of indicators on the monitoring of elements specific to the estimation of GHG emissions afferent to the waste sector;
- Reducing the quantities of organic waste stored through management measures that shall follow the expansion of the practices on the energy recovery of emissions resulting from the decomposition of organic waste.

The waste management issue impacts several strategic directorates, respectively:

- The rational correlation of the development objectives, including investment programs, with the capacity to support the natural capital;
- Using the economically and ecologically best available technologies in the investment decisions from public funds; firmly introducing eco-efficiency criteria in all production or service activities;
- Prediction of climate change effects and drawing up both long term adaptation solutions, and inter-sectorial contingency measure plans, including alternative solution portfolios for crisis events generated by natural or anthropogenic phenomena.

The enforcement of the waste hierarchy is required to this extent, placing emphasis on the prevention of waste generation, preparation for reuse, recycling and recovery, while waste storage should be seen as the last available option meeting the highest level of resource loss and degradation.

Currently, the efficient use of natural resources is not integrated or is only partially integrated in economic decisions, which, in certain cases, results in the overuse of resources. On a long term, such an approach not only could not efficiently support economic development, but it also has the risk that, through the breaching of critical thresholds, certain natural resources will no longer be able to be replaced. Thus, the need for a sustainable approach for the development of an economy is outlined, that shall be characterized by the efficient management of all natural resources, irrespective of the development stage.

The meeting of the following strategic objectives is stipulated in the ***National strategy on the sustainable development of Romania (2013-2020-2030)*** (NSSD), approved by GD no. 1460/2008, for the Waste sector:

- *2020 horizon*: Reaching the current average level of EU member states on the main indicators of sustainable development.
- *2030 horizon*: Romania's significant approaching of the average level of the respective year of EU MS in terms of the sustainable development indicators.

The main waste management objectives are indicated in the strategy:

- By 2015 – reducing the number of historically polluted areas in minimum 30 counties;
- By 2015 – creating 30 regional/county integrated waste management systems; closing 1,500 small storage facilities located in rural areas and 150 old storage facilities in urban areas; performing 5 pilot projects for the rehabilitation of historically contaminated sites; providing improved waste removal and management services for 8 million inhabitants;
- In the Sectorial operational program "Environment" (SOP Environment), Priority axis 2 "Development of integrated waste management systems and rehabilitation of historically contaminated sites" supports investments ensuring the development of such systems and the expansion of the waste management infrastructure. The activities carried out in major intervention area 2.1 fund the following indicative activities: the procurement and installation of the separate collection systems, the construction of sorting, composting and

recycling facilities, the procurement of waste transport vehicles, the closing of non-compliant storage facilities, the construction of transfer stations and municipal waste disposal facilities, the construction of adequate hazardous waste facilities, as well as technical support for project preparation, management, supervision and advertising.

The national strategy on waste management (SNGD), approved by GD no. 870/2013, occurred from the need to identify the action objectives and policies that Romania shall follow in the waste management area, to reach the recycling company status.

The SNGD establishes the strategic policy and objectives of Romania in the short (2015) and medium term (2020) waste management area. The National plan on waste management (PNGD) is drawn up for the short term implementation of the strategy, containing details on the actions to be taken to meet the strategy objectives, the performance of such actions, including targets, terms and responsibilities for implementation.

The SNGD scope is to establish the strategic direction for the prevention of waste generation and management, by 2020, by:

- Setting the efforts top priority in the waste management area, based on the waste hierarchy;
- Encouraging waste generation prevention and reuse, to increase resource efficiency;
- Developing and expanding the separate waste collection systems to promote high quality recycling;
- Developing/implementing recycling technologies/facilities and/or recovery with a high efficiency in the extraction and use of waste raw material;
- Supporting waste-to-energy recovery, as applicable, for waste that cannot be recycled;
- Reducing the quantities of waste disposed through storage.

A set of 8 strategic objectives was drawn up to meet the SNGD scope:

- Improving environmental quality and the protection of the population's health through the integrated approach of waste management environmental issues;
- Supporting research/development activities on waste management by identifying the areas of intervention and attracting financing sources for waste sector research/management activities;
- Encouraging green investments through the development of green investment project support mechanisms;

- Increasing the efficiency of using resources to promote eco-innovation and apply the extended responsibility of producers;
- Sustainable waste management by:
  - ✓ Applying the waste hierarchy, according to the order of priorities (encouraging actions on the prevention of efficient waste generation and management, by preparing for reuse, recycling, recovery, and, as a last option - disposal);
  - ✓ Approaching the life cycle analysis;
  - ✓ Diversifying the use of economic tools;
  - ✓ Consolidating the surveillance and control system through regulations;
  - ✓ Developing the waste management infrastructure.
- Correlating the waste management policy provisions with those on climate changes, by integrating issues on climate change in the waste management plans and supporting investments reducing the carbon footprint;
- Developing responsible behavior on waste generation prevention and management through the promotion of community awareness/information campaigns and the involvement of civil society;
- Strengthening institutional capacity.

The enforcement of Directive 2008/98/EC sets ambitious objectives for Romania: the recycling of 50% household waste and of 70% construction and demolition till 2020. Romania shall adopt measures on the development of waste treatment facilities, simultaneous with the enforcement of a policy encouraging separate waste collection and recycling in the country, in observance of the proximity principle.

4.1.1.4.2.9.2 The national strategy on sludge management in Romania

The general objective of the strategy is the long term improvement of environmental quality factors by minimizing the negative effects of inadequate sludge management.

The scope of the strategy and of the action plan is to provide a framework for the planning and implementation of the sludge management systems and practices in an economically and environmentally efficient way.

The specific objectives of the national strategy can be defined as:

- Improving the national legal and institutional system and the reporting system;
- Minimizing the treatment sludge production by preventing excessive waste and prohibited substance discharges in the sewage system, e.g. By improving control on industrial discharges in the sewage system;
- Improving the treatment of waste waters and sludge's to improve sludge quality, so that it becomes adequate for use or for beneficial disposal;
- Providing guidance for sludge producers (water and waste water operators) in the development of sludge usage/recovery or beneficial disposal paths;
- Providing guidance on the improvement of the generated sludge quality analysis and monitoring capacity;
- Improving public and institutional information on the acceptable uses/methods of recovery of treatment sludge;
- Guidance on the monitoring of sludge-receiving agricultural lands and potential constraints on the sludge use/beneficial recovery options.

4.1.1.4.2.10Waste water treatment

The legislation in force shall be observed to prevent the pollution of surface water sources with waste waters resulting from anthropogenic sources. The legislation mainly refers to the quality indicators of the waste waters discharged in tributary streams.

The basis of the European Union legislation on waste waters is Directive 91/271/EEC of May 21st, 1991 on the treatment of urban waste waters, amended and supplemented by Commission Directive 98/15/EC of February 27th, 1998. Directive 91/271/EEC was fully transposed in the Romanian legislation by Romanian Government Decision no. 188/2002 approving certain norms on the conditions for the aquatic discharge conditions of waste water, amended and supplemented by Romanian Government Decision no. 352/2005. GD no. 188/2002 contains the following capital importance annexes in the collection, transport, treatment and discharge of waste waters:

- Annex 1. Technical norms on the collection, treatment and discharge of municipal waste waters, NTPA – 011;

- Annex 2. Norm on the conditions on the discharge of waste waters in the sewage systems of localities and directly in treatment stations, NTPA – 002;
- Annex 3. Norm on establishing the pollutant loading limits of industrial and municipal waste waters, on discharge in natural receptors, NTPA – 001.

The main objective of Directive 91/271/EEC is to protect the environment from the negative impacts of the discharges of urban waste waters and of waste waters from certain industrial sectors (mainly food industry product processing and manufacturing).

In Romania, the European legislation on the treatment of waste water and discharge in the aquatic environment was transposed between 2002 and 2005, however, implementation stages for full conformity with the Directive requirements are still required.

Considering both Romania's positioning in the hydrographic basin of the Danube river and in the Black Sea basin, as well as the need for environmental protection in such areas, Romania declared its entire territory as a sensitive area. The decision materializes through the fact that agglomerations with over 10000 equivalent inhabitants shall ensure an infrastructure for the treatment of urban waste waters enabling advanced treatment, particularly in terms of the nitrogen and phosphor nutrients. Secondary treatment (the biological step) is a general rule for agglomerations under 10000 equivalent inhabitants.

The Directive implementation terms vary and depend on the size of the agglomeration and the impact thereof on the receptor waters. The final transition term for the implementation of the Directive was set for December 31st, 2018, with interim terms for the collection and treatment of urban waste waters.

Measures for the limitation and/or reduction of GHG emissions resulting from the treatment of household waste waters are as follows:

- Increasing the connection level to waste water sewage and treatment services;
- Construction and commissioning new waste water treatment stations;
- The rehabilitation and upgrade of the existing waste water treatment stations;
- Using modern, low power technologies;
- The automation of the waste water treatment facility operation, with benefic implications on the optimum operation thereof, respectively the avoidance of methane gas emissions;

- Collecting household sludge's per geographic areas, the processing thereof through anaerobic fermentation in modern and safe biogas production facilities.

4.1.1.5 Information on WAM projection scenario

The estimated total effect of ***planned PAMs*** till 2035 was calculated for group of policies and measures, as the difference between the GHG emissions in the WEM scenario and WAM scenario.

The PAMs included in the WAM scenario consists of a set of additional measures that are likely to be implemented by national government (egg. a higher rate of penetration of high-efficiency cogeneration plants and of renewable sources, additional energy efficiency measures in the buildings and transport sector, etc.) and by companies/business/industrial association (egg. modernisation of industrial sector, improving coal handling technologies, implementing best technologies for solvent and other products, etc.), as voluntary agreements.

4.1.1.6 Qualitative information regarding the links between policies and measures reported and their contribution to the achievement of low-carbon development strategy

Romania has currently in place its National Climate Change Strategy 2013-2020, adopted by the Governmental Decision no. 529/2013, that analyses the post-Kyoto objectives, targets and actions and covers both mitigation and adaptation components. The strategy includes the main data and information on sectorial GHG emission shares and trends, and also the key mitigation and adaptation policies and measures.

The strategy does not pinpoint on specific national targets on various sectors. The document is also lacking particular indicators and timelines for the objectives referred within as building the path towards an economy and society resilient to climate change. The low carbon development pathway as such is also insufficiently highlighted within the current strategy.

In order to consolidate the current strategy, with an accent on low carbon development horizon, the government of Romania through the MEWF agreed with the World Bank (WB) on a two years program to provide advisory services on climate change.

In order to operationalize the current strategy, the advisory services would be focus on establishing cross-sectorial priorities for achieving GHG emission reduction targets in Romania and for adapting to climate change, schedule of measures and indicators assessing and, respectively, developing a national action plan with identifiable actions, timelines and indicators along various PAMs.
Due to the deadline of the final version of the consolidated strategy on low carbon, by the end of 2015, the contribution of PAMs reported will be assessed for the next submission.

Data and information on mitigation actions are also included in the CTF table 3.

4.1.2 Changes in its domestic institutional arrangements, including institutional, legal, administrative and procedural arrangements used for domestic compliance, monitoring, reporting, archiving of information and evaluation of the progress towards the economy-wide emission reduction target

No changes in its domestic institutional arrangements, including institutional, legal, administrative and procedural arrangements used for domestic compliance, monitoring, reporting, archiving of information and evaluation of the progress towards the economy-wide emission reduction target occurred compared to the arrangements associated to the Sixth National Communication on Climate Change and First Biennial Report of Romania.

4.1.3 Information on the assessment of the economic and social consequences of response measures.

According to the Article 3.14 of the Kyoto Protocol, Annex I countries will take mitigation measures in such a way as to minimize adverse social, environmental and economic impacts on developing countries.
As Romania pointed out in the previous National Communications on Climate Change following the Article 12 of the UNFCCC and also to the European Commission and the European Environmental Agency, following the Regulation no. 525/2013 of the European Parliament and of the Council on a mechanism for monitoring and reporting greenhouse gas emissions and for

reporting other information at national and Union level relevant to climate change and the Commission Implementing Regulation (EU) no. 749/2014, the levels of GHG emissions during 1989-2013 were far below the reduction commitments taken within the Kyoto Protocol.

This reduction of emissions was mainly the consequence of the decline of the economic activities, the upgrading of technologies and energy efficiency projects promoted as a result of the approximatively process of the European acquis communitaire.

The GHG emissions reduction achieved have allowed our country to participate from the early stage at the implementation of the AIJ and JI mechanism in order to upgrade and refurbish the old technologies and improve energy efficiency. An important role in the reduction of GHG emissions was played by the participation since 2007 at the application of the Emission Trading Scheme.

Therefore we can appreciate that the national climate change policy developed so far to reduce GHG emissions has had no impact abroad and especially on developing countries.

Nevertheless Romania is of the opinion that the technical and financing assistance towards the developing countries is very important for the development international policy on climate change, and is willing to join the European Union initiative to provide a “fast start financing” for the developing countries.

Under the fast start financing Romania decided to focus its contribution for the benefit of developing countries associated to the Copenhagen Accord, countries which have committed to take GHG emissions reducing measures and have developed economic strategic partnership relations with our country.

The Republic of Moldavia has associated itself to the Copenhagen Accords and has committed to reduce the GHG emissions until 2020 by 25% in comparison with the 1990 level.

In this context the 15 million Euros Romanian contribution planned for the fast start financing mechanism will be used for energy efficiency and transport infrastructure projects with a view to develop climate change mitigation policy, efficiency of natural resources use and the European integration of the Republic of Moldavia.

4.2 Estimates of emissions reductions and removals and the use of units from the market-based mechanisms and land use, land-use change and forestry activities

The data and information under paragraphs 9 and 10 in the Annex I to Decision 2/CP. 17 are included in the Common Tabular Format tables 4-4(b).

5 PROJECTIONS

5.1 Updated projections for 2020 and 2030

Projections data for 2015, 2025 and 2035 and updated projections data for 2020 and 2030 years are provided through the Common Tabular Format Tables 6(a)-6(c), based also on the relevant provisions in the Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications.

Summary of key variables and assumptions used in the projections analysis is included in the Common Tabular Format Table 5.

5.2 Changes in model and methodologies

No changes in respect to the model and methodologies used for the preparation of projections data occurred compared to those presented in the Sixth National Communication on Climate Change of Romania.

6 PROVISION OF FINANCIAL, TECHNOLOGICAL AND CAPACITY-BUILDING SUPPORT TO DEVELOPING COUNTRY PARTIES

Pursuant to the relevant provisions in Decisions no. 2/CP. 17 and no. 19/CP. 18 data and information for public financial support are included in CTF tables 7-7 (b) for contribution through bilateral, regional and other channels.

Each of the above mentioned tables include information on the financial support provided and pledged for the purpose of assisting non-Annex I parties to mitigate GHG emissions and to adapt to the side-effects of climate change.

Additionally, the contribution through multilateral channels (Table 7 (a)), the technology support and transfer (Table 8) and capacity-building (Table 9) were not provisioned for the above mentioned period.

7 OTHER REPORTING MATTERS

7.1 Domestic arrangements established for the process of the self-assessment of compliance with emission reductions in comparison with emission reduction commitments or the level of emission reduction that is required by science

The Ministry of Environment, Waters and Forests has provided funding for relevant studies with the objective to identify the most efficient institutional arrangements for the implementation of the Decision nr. 406/ 2009/ EC on effort sharing. Under this Decision, the coordination between the central and local authorities and the self-assessment of compliance to evaluate the effects of policies and measures and estimate the projections of emissions are very important. The conclusions of the studies promoted give solutions to the process of the self-assessment of compliance with emission reductions in comparison with emission reduction commitments or the level of emission reduction that is required by science. At present climate science is performed by the Research and Development National Institute for Environment Protection, a research institute coordinated by the Ministry of National Education and Scientific Research and by another very important research institute with which our ministry had numerous contracts. The close links with these research institutes and the advice from the National Commission on Climate Change enhance our capacity for self-assessment.

For the process of the self-assessment of compliance with emission reductions in comparison with emission reduction commitments Romania also uses:

- the National Greenhouse Gas Inventory reported annually as a Party to the United Nations Framework Convention on Climate Change (UNFCCC), to the Kyoto Protocol and as a Member State of the European Union;
- the data and information on policies and measures to mitigate GHG emissions and enhance removals and, respectively, on GHG emissions/removals projections, officially submitted biennially to the European Commission and to the European Environment Agency under the Regulation no. 525/2013 and to the UNFCCC Secretariat as part of the Biennial Report;

additionally, data and information is included every four years in the National Communication on Climate Change, officially submitted to the UNFCCC Secretariat.

7.2 Progress made in the establishment of national rules for taking local action against domestic non-compliance with emission reduction targets

So far except for the economic operators under the EU ETS which have to comply with relevant legislation for non-compliance, there is not in place yet a system for taking local action against domestic non-compliance with emission reduction targets. The rules and procedures for non-compliance are being established following the conclusions included in the studies mentioned in the previous section.

7.3 Any other information that the Party considers relevant to the achievement of the objective of the Convention

Not applicable.

REFERENCES

1. 2015 National Greenhouse Gas Inventory of Romania, Ministry of Environment, Waters and Forests, 2015;
2. Romania's 2015 Report on policies and measures that limit or reduce greenhouse gas emissions by sources or enhance removals by sinks, report under Article 13 of the Regulation (EU) no. 525/2013 of the European Parliament and of the Council on a mechanism for monitoring and reporting greenhouse gas emissions and for reporting other information at national and Union level relevant to climate change and repealing Decision no. 280/2004/EC, Ministry of Environment Waters and Forests, 2015;
3. Romania's 2015 Report on projections of anthropogenic greenhouse gas emissions by sources and removals by sinks, report under Article 14 of the Regulation (EU) no. 525/2013 of the European Parliament and of the Council on a mechanism for monitoring and reporting greenhouse gas emissions and for reporting other information at national and Union level relevant to climate change and repealing Decision no. 280/2004/EC, Ministry of Environment, Waters and Forests, 2015;
4. Romania's Report on financial and technology support provided to developing countries pursuant to Art. 16 of Regulation (EU) no. 525/2013, Ministry of Environment, Waters and Forests, 2015;
5. Romania's Sixth National Communication on Climate Change and First Biennial Report, Ministry of Environment and Climate Change, 2013;
6. Report of the technical review of the first biennial report of Romania, UNFCCC Secretariat, 2015;
7. Decision 2/CP. 17 Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention, UNFCCC, 2012;
8. Decision 19/CP. 18 Common tabular format for "UNFCCC biennial reporting guidelines for developed country Parties", UNFCCC, 2013;
9. Compilation of economy-wide emission reduction targets to be implemented by Parties included in Annex I to the Convention, UNFCCC, 2011;
10. Additional information relating to the quantified economywide emission reduction targets contained in document FCCC/SB/2011/INF.1/Rev. 1, UNFCCC, 2012.