MINISTRY OF ENVIRONMENT AND WATER MANAGEMENT OF ROMANIA

REPORT on DEMONSTRABLE PROGRESS in IMPLEMENTING the KYOTO PROTOCOL

Romania

Bucharest

January 2006

CONTENT

INTRODUCTION

Climate change is one of the major challenges of the XXI century - a complex area where the humanity still needs to improve the knowledge and understanding in order to take timely and correct measures for tackling climate change effects in the most cost-effective way, while following the precautionary principle.

Climate change affects all continents, regions, countries, as well as human beings in different ways and time periods. In 2005, Romania has just experienced an increased incidence of flooding in almost entire territory, which have impacted on the economy and even produced human losses that have greatly affected the country. Whether or not these were the direct results of climate change, they provide an indication of the kind of future impacts that climate change may have on agriculture, water management, forests, and the society.

Romania, as the first UNFCCC Annex I Party that ratified the Kyoto Protocol not only committed to reduce GHG emissions but also engaged itself in the last decade in a social, economical and financial reform that resulted in a real reduction of emissions.

The entry into force of the Kyoto Protocol, the recent adoption of the Marrakech Accords and the start of the negotiation process for the post-2012 actions represent historical moments which have given new hope that the future will be improved due to convergence of efforts and increased coherence of actions and measures.

During the process of accession to the European Union, Romania implemented concrete actions in 2005 such as the development of the National Strategy and Action Plan on Climate Change – adopted by Governmental Decisions – and has started the implementation of the EU Emissions Trading Scheme as well as other climate change related actions promoted by the EU.

Based on the first National Strategy on Climate Change, Romania is taking important steps towards a targeted and coordinated national effort to meet the United Nations Framework Convention on Climate Change (UNFCCC) and Kyoto Protocol commitments, limit GHG emissions and deal with climate change effects that are to be expected, regardless of efforts to limit GHG emissions.

Considering the relative high level of energy intensity, Romania has a great potential to attract foreign investments through the implementation of Kyoto Protocol's flexible mechanisms which aim to bring more energy efficiency and cost-effective technologies in the power, heating, industrial and transportation sectors.

Romania is commending the scientific activities of the Intergovernmental Panel on Climate Change and considers, especially the outcomes of the Third Assessment Report, the methodologies for National Greenhouse Gas Inventories and the other special reports like the "Safeguarding the Ozone Layer and the Global Climate System" and the "Carbon Dioxide Capture and Storage".

1. DESCRIPTION OF DOMESTIC MEASURES

Romania signed the UNFCCC, in 1992 at the Rio de Janeiro Earth Summit, ratified then by Law no. 24/1994. Romania was the first country included in the Annex I of the UNFCCC (developed and economies in transition countries) which ratified the Kyoto Protocol to the UNFCCC, committing itself to reduce the greenhouse gas (GHG) emissions with 8%, in the first commitment period 2008-2012, comparing to the base year (1989). The base year for Romania was established 1989, because this year expressed the best Romania's economic output potential directly connected with the Romania's emissions potential. The economic decline resulted in a relevant decrease in the GHG emissions.

Concerning the progress in implementing the UNFCCC and the Kyoto Protocol, in 2005 Romania managed for the fourth time to submit to the Secretariat the national greenhouse gas inventory with all its components, meeting also the requested deadline. According to this document, the total GHG emissions of Romania (without sinks), calculated in CO_2 equivalent, decreased with 46% in the period 1989-2003. Romania will achieve the Kyoto Protocol's 8% GHG emissions reduction target in the first commitment period, even considering the slight increasing trend of the GHG emissions noticed after 1999.

Starting with the 2005 submission, emissions were reported using the new software programme CRF Reporter developed by the UNFCCC Secretariat. The national GHG inventories for the years covered by the period 1989-2002 were recalculated based on the report of the individual review of the GHG inventory submitted by Romania in 2004.

In the same time, the elaboration of the Third National Communication of Romania to the UNFCCC (NCIII) was finished with the financial support of the Danish Ministry of Environment and submitted it to the Secretariat with some delay from the deadline due to the lack of resources as in many other countries with economy in transition. The Danish Environmental Protection Agency financed the editing publishing and printing of the document. In March 1995, Romania submitted its first National Communication (NCI) to the UNFCCC Secretariat in accordance with Article 12 of the Convention. The second National Communication (NCII) (comprising the GHG emissions inventories for 1989, 1990 and 1991) was submitted in April 1998 and was revised by an international expert review team.

In the first half of 2005, the Ministry of Environment and Water Management (MEWM) has developed the first National Strategy on Climate Change of Romania (NSCC), based on a capacity building project financed by the Danish Environmental Protection Agency (DEPA) and in close cooperation with the international consultants and other ministries through the National Commission on Climate Change (NCCC) presenting the framework for implementing Romania's climate change policy in the period 2005-2007. The National Action Plan on Climate Change (NAPCC) elaborates further the individual policies and concrete measures to be developed and implemented under the NSCC.

Romania has already introduced and it is in the process of implementing several polices and measures that directly or indirectly reduced GHG emissions as a result of the transposition of the EU acquis communautaire. A substantive potential

still remains to be exploited. The objective therefore is to continue implementing the existing domestic policies and measures to reduce the carbon intensity of the Romanian economy in full compliance with the EU acquis communautaire.

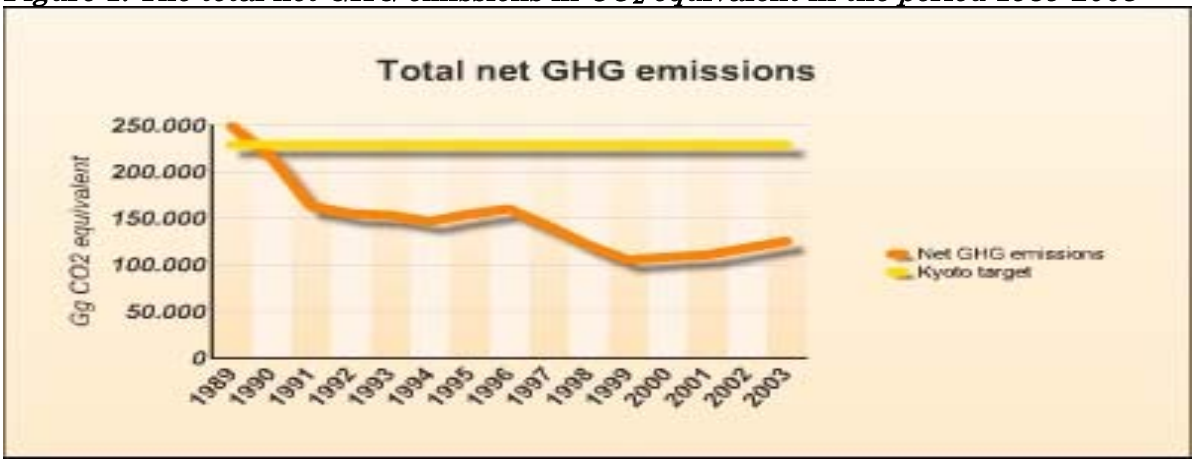
The most important objective regarding the adaptation to climate change is to limit the long-term economic, environmental and social costs of the climate change impacts in Romania in order to limit the economic and social costs of climate change in Romania. The knowledge related to the impacts of climate change, vulnerability and adaptation will be increased. No-regret and cost-effective precautionary adaptation policies and measures will be identified and prioritized based on the improved knowledge.

Based on the provisions of the UNFCCC and its Kyoto Protocol, Romania started a series of bilateral cooperation programmes with various Annex I countries (Switzerland, the Netherlands, Norway, Denmark, Austria, Sweden, France) and the Prototype Carbon Fund (PCF) established by the World Bank. There are 8 Memoranda of Understanding on cooperation under Article 6 of the Kyoto Protocol for Joint Implementation (JI) projects between Romania and the afore-mentioned countries and a Host Country Agreement with World Bank. These Memoranda provide the general legal framework for cooperation on the development of real Joint Implementation projects aiming at reducing the GHG emissions in Romania and in the same time improving some social aspects of life by developing such projects in areas where problems exist and where a lack of financing for these problems is observed. Based on these Memoranda Romania has already approved 12 JI projects, which are in different stages of development or finished.

The National Registry on GHG emissions will be established in the coming period within the National Agency for Environmental Protection (NEPA) under the guidance of the MEWM based on a capacity building project financed by DEPA.

Regarding the improvement of the awareness on climate change, a specific chapter on climate change was introduced on the MEWM website and the information will be periodically updated. The chapter includes the primary legislation in Romanian, the National GHG Inventory, the Third National Communication to UNFCCC, the Memoranda of Understanding and the JI projects, the National Strategy and Action Plan in Romanian and English and other relevant information.

Figure 1. The total net GHG emissions in CO_2 equivalent in the period 1989-2003



The GHG emission trends reflect the main characteristics of the country's economic development. The period 1989-2003 was characterized by a restructuring process of the economy and transition to a market economy, bringing into operation the first reactor at the Cernavoda nuclear power plant (1996). After 1999 the improvement of the economic indicators was reflected by the slight increase of the overall GHG emissions.

In 2003, the most relevant GHG was carbon dioxide (CO_2) contributing with 75% of the total national GHG emissions expressed in CO_2 equivalent, followed by CH_4 with 18.8% and N_2O with 5.7%. PFCs, HFCs and SF_6 contributed with only 0.5% of the overall GHG emissions in the country. In the 2005 submission, emissions of HFCs and SF_6 were reported for the first time, representing the period 1995-2003, 1995 being considered the first year when these substances were used in Romania.

According to the Figure 1, there is a great probability for Romania to meet the Kyoto Protocol commitments to reduce the GHG emissions in the first commitment period (2008-2012).

LEGISLATION

The existing legal framework in Romania in the field of climate change, for a unitary application of the UNFCCC and the Kyoto Protocol consists of:

- primary legislation including specific acts on climate change;
- general environmental regulations including climate change aspects;
- specific legislation related to energy, transports, agriculture, and waste.

The primary legislation contains mainly the multilateral environmental agreements in the field of climate change or in other related fields that were ratified by Romania and the strategies and action plans:

- Law No. 24/1994 ratifying the UN Framework Convention on Climate Change;
- Law No. 3/2001 ratifying the Kyoto Protocol to the UNFCCC;
- Governmental Decision No. 1275/1996 regarding the establishment and the functioning of the National Commission for Climate Change. The Commission promotes the necessary measures and actions for a unitary implementation of the UNFCCC's objectives;
- Governmental Decision No. 645/2005 regarding the approval of the National Strategy of Romania on Climate Change;
- Governmental Decision No. 1877/2005 regarding the approval of the National Action Plan of Romania on Climate Change;
- Law No. 111/1998 ratifying the UN Convention to Combat Desertification;
- Law No. 58/1994 ratifying the UN Convention on Biological Diversity;
- Law No. 84/1993 ratifying the UN Convention on the Protection of the Ozone Layer and the Montreal Protocol on Substances Depleting the Ozone Layer;

Regarding the general environmental regulations that include climate change aspects, Romania adopted the most important legal acts presented above:

- Law No.137/1995 on Environmental Protection, as amended by Emergency Governmental Ordinance No. 195/2005 - contains a special chapter regarding

atmosphere protection, climate change, emissions trading, national registry, national inventory and the general requirements concerning the environmental permit, and the control procedure, etc.

- Law No. 655/2001 on Atmosphere Protection - represents the framework atmosphere protection act aiming "to prevent, eliminate, limit deterioration and improve air quality, in order to avoid negative impacts on human health and the environment". The law required the establishment of the National System for Integrated Air Quality Assessment and Management (Governmental Decision No. 586/2004), coordinated by the Ministry of Environment and Water Management;
- Law No. 645/2002 regarding the integrated pollution prevention and control (transposing the EU IPPC Directive).

Climate change aspects are also presented in the Government Programme for the period 2005-2008 and in the Governmental Decisions for establishing and functioning of the Ministry of Environment and Water Management, the National Agency for Environmental Protection and the Regional Agencies for Environmental Protection.

Some specific legal acts related to energy, transports, agriculture, and waste include or refers to climate change aspects:

- Law No. 287/2002 regarding the establishment, organization and functioning of The Romanian Energy Efficiency Fund;
- Law No. 199/2000 regarding the efficient use of energy;
- Law No. 318/2003 regarding electric energy;
- Governmental Decision No. 443/2003 regarding the promotion of energy form renewable sources (transposing the EU Directive 2001/77/EC);
- Governmental Decision No. 162/2002 on land-filling of waste;
- Governmental Decision No. 541/2003 on limitation of emissions from large combustion plants (transposing the EU Directive 2001/80/EC)
- Law no. 26/1996 – The Forest Management Code.

A number of new legal acts and regulatory changes will result from the implementation of the National Action Plan on Climate Change in the period 2006-2007, especially related to the EU Directive 2003/87/EC concerning the establishment of the EU Emissions Trading Scheme.

INSTITUTIONAL FRAMEWORK

The existing institutional framework in Romania in the field of climate change consists of:

Ministry of Environment and Water Management (MEWM) is the governmental institution authorized to develop and carry out the state policy related to the protection of the environment. In the field of climate change:

- MEWM is authorized to conduct activities pertaining to the implementation, coordination, control and evaluation of policies and measures related to the implementation of the UNFCCC and the Kyoto Protocol;

- MEWM has been assigned UNFCCC Focal Point and represents the Romanian Government in the UNFCCC negotiations and other meetings on climate change;

- MEWM plays a leading role in the development, implementation and update of the National Strategy and Action Plan on Climate Change;

- MEWM coordinates the implementation of the flexible mechanisms under the Kyoto Protocol, Joint Implementation (JI) and International Emission Trading;

- MEWM chairs the National Commission on Climate Change (NCCC).

The capacity of the MEWM in terms of available staff has been increased in 2005, particularly by establishing a new Directorate for Environmental Policies, Air Quality and Climate Change. This Directorate coordinates and implements MEWM's activities regarding climate change.

National Environmental Protection Agency (NEPA) is the central institution, which ensures the technical support for MEWM and coordinates the regional EPAs and county-level EPAs. NEPA coordinates the elaboration, implementation and monitoring of environmental strategies and action plans at national, regional and county level.

National Commission on Climate Change was established in 1996 by Governmental Decision no. 1275 and operates as the main advisory body to the minister of environment on decisions regarding climate change policy. The tasks include advisory services in connection with the approval of national communications and GHG inventories, and the approval of JI projects and emissions trading activities. The following Ministries are also represented in the NCCC having also responsibilities in developing and implementing specific policies and measures and facilitating the implementation of these policies and measures: Ministry of Economy and Trade, Ministry of Foreign Affairs, Ministry of Public Finance, Ministry of Administration and Interior, Ministry of Agriculture, Forests and Rural Development, Ministry of Transport, Construction and Tourism, Ministry of National Defense, and Ministry of Education and Research.

Regional and local authorities, particularly the municipalities, play an important role in the implementation of local policies and measures in reducing the carbon intensity of the Romanian economy, as well as related to adaptation to the negative impacts of climate change. In the same time, municipalities have a crucial responsibility in accepting and endorsing Joint Implementation projects.

Some **research institutions** currently support the government in developing and implementing climate change policies, such as the National Research and Development Institute for Environmental Protection (ICIM), the National Administration for Meteorology (ANM) and the Institute for Research on Forestry Management (ICAS).

NATIONAL STRATEGY AND ACTION PLAN

In 2005, through the National Strategy on Climate Change (NSCC) and the National Action Plan on Climate Change (NAPCC) the Romanian Government addressed the requirements in this field resulting from the future membership of the

EU as well as from the international commitments under the UNFCCC and Kyoto Protocol, in order to prepare for the most feasible national approach in the short and medium term.

The NSCC represented the first step and it was followed immediately by the NAPCC, which prioritized the actions needed to implement the strategy at all levels. The challenge of responding to climate change in Romania will not be completed by implementing the provisions contained in these documents. Future international and European actions in this area will place new requirements and will call for innovative policies and measures in the coming years. Romania shall start by taking early action to lower the energy and carbon intensity of the economy and preparing the adaptation for possible climate change impacts.

The National Strategy and Action Plan on Climate Change have been developed under the responsibility of the Ministry of Environment and Water Management in close cooperation with other ministries through the National Commission on Climate Change (NCCC). The financial and technical support for their elaboration was provided by the Danish Environmental Protection Agency based on the capacity building programme between Romania and Denmark.

Government, business and industry, NGOs, research institutions, local governments as well as individual consumers and citizens, all have responsibilities in this area in the years to come and all will have to contribute to reach the objectives presented in NSCC and NAPCC. In this respect, an important concern of the Government through the implementation of the strategy and action plan is to strengthen the capacity of stakeholders at all levels and to ensure access to information and public participation in the decision-making process.

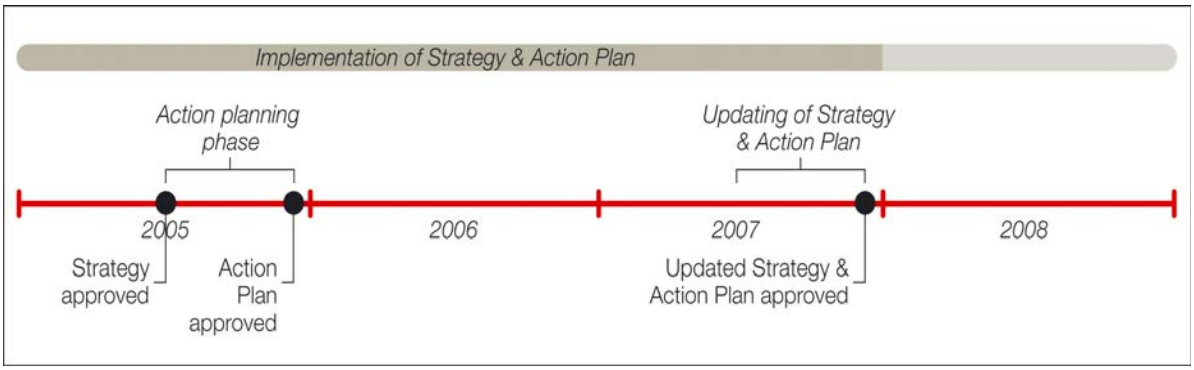
National Strategy on Climate Change (NSCC)

The National Strategy on Climate Change of Romania outlines Romania's policies in meeting the international obligations under the UNFCCC and the Kyoto Protocol as well as Romania's national priorities concerning climate change in the period 2005-2007.

The NSCC also specifies the environmental and economic benefits for Romania regarding the participation in the flexible mechanisms provided by the Kyoto Protocol, namely Joint Implementation (JI) and International Emissions Trading (IET). Furthermore, the main approach is established for implementing the climate change activities necessary for Romania's accession to the European Union and for participating in the EU Emissions Trading Scheme.

The time frame of the NSCC and its specific objectives cover the period until the end of 2007. The actions defined in the NAPCC will be carried out during the same period. This relatively short period is adopted because of the rapid changes in the national economic situation and the international climate change regime. Regarding the impact assessment of the NSCC and NAPCC, a longer-term perspective was taken, in particular up to the end of the first commitment period of the Kyoto Protocol, in 2012. Romania's accession to the EU will make an update of the NSCC and NAPCC necessary before 2008.

Figure 2. The Strategy and Action Plan process



In order to meet the overall objectives, the National Strategy mentions the following specific objectives:

- meeting the 8% reduction target of the national GHG emissions as it is provided by the Kyoto Protocol;
- reducing the long-term economic, environmental and social costs of the climate change impacts in Romania;
- establishing an adequate policy, legal and institutional framework allowing for the development and implementation of policies and measures;
- improving the national system for estimating GHG emissions and sinks, in compliance with UNFCCC and EU requirements;
- participating in flexible mechanisms under the KP (JI and IET) to the maximum benefit of the Romanian environment and economy, and in a stable and transparent domestic framework;
- preparing Romania's position regarding future international climate change policies and regulatory regimes post-2012;
- transposing and implementing the EU directives regarding Emissions Trading Scheme to allow the start of trading from 1 January 2007 (date of accession of Romania to the EU);
- continuing the implementation of domestic policies and measures to reduce the carbon intensity of the economy, in full compliance with the EU legislation;
- incorporating climate change issues in education and research, and increasing the level of awareness and public participation of stakeholders in decision-making process.

National Action Plan on Climate Change (NAPCC)

NAPCC has been developed as the main instrument in implementing the NSCC and operationalizing the NSCC's objectives into specific actions, for the period

2005-2007. The NAPCC specifies the means of implementing NSCC and determines the ways of reporting the progress of the implementation. The NAPCC assigns tasks and responsibilities to individual institutions and clearly identifies the responsible actor(s) for the specific actions and related tasks. Clear timeframes for the actions to be carried out have been set, and sources of funding for the specific actions were identified where possible.

The NAPCC has been prepared within a process coordinated by MEWM with significant involvement and contributions of key stakeholders including ministries, agencies, institutes, private sector, NGOs and relevant experts that were divided in 4 working groups based on the different themes in the field of climate change. This stakeholder participation approach has had a vital importance, as the contribution and commitment of the parties that will be responsible for the implementation of the plan is crucial for the successful implementation of the NAPCC. The structure of the NAPCC has been divided based on the NSCC and the relevant issues related to climate change:

- Chapter 1 – Cross-cutting issues (2 actions)
- Chapter 2 – Reporting under the UNFCCC, Kyoto Protocol and EU (6 actions)
- Chapter 3 – Vulnerability, impacts and adaptation (5 actions)
- Chapter 4 – Flexible mechanisms provided by the Kyoto Protocol (5 actions)
- Chapter 5 – EU emissions trading scheme–EU ETS (6 actions)
- Chapter 6 – Policies and measures for GHG emissions reduction (7 actions)
- Chapter 7 – Awareness, education and public participation (3 actions)

The progress in implementation of the NSCC and the NAPCC will be reported annually by the Ministry of Environment and Water Management to the National Commission on Climate Change, based on the input from other ministries and responsible actors.

The NSCC and the NAPCC are dynamic instruments that will be updated on a regular basis in order to reflect changing circumstances in the Romanian economy as well as the increased knowledge in the field. During 2007, both documents will be updated before the start of the first commitment period of the Kyoto Protocol, 2008-2012.

CAPACITY BUILDING

In the period passed from the 7th Conference of the Parties to the UNFCCC, there were not so many capacity building programs, based on the Decision 3/CP.7 in which Romania to be involved. In the last period, this process is increasing significantly due to the implementation of the bilateral agreements in the field of climate change and development of Joint Implementation projects signed by Romania with Switzerland, Norway, the Netherlands, Austria, Denmark, Sweden, France, and World Bank's Prototype Carbon Fund.

Romania was able to submit for the first time the GHG inventories in the required format (CRF + NIR) after the participation of an expert from the Ministry of Environment as an observer in one of the in-country reviews of the GHG inventory organized by the UNFCCC Secretariat in 2002. The GHG inventory reviews provide a great opportunity for the invited experts to share views on the inventory preparation and submission process and are very important for experts in the EIT countries. The training programme for members of expert review teams for the technical review of GHG inventories of Parties included in Annex I to the Convention organized by the UNFCCC Secretariat is also one of the useful instruments for enhancing the capacity of EIT countries in this field. Romania benefited from both participation in the training programme with an inventory expert and hosting an in-country review of the GHG inventory based on which the GHG inventory submissions were improved over the last couple of years.

It is also relevant to mention the importance of the support provided by the UNFCCC Secretariat to finance the participation of Romanian experts in different activities from COP and SB meetings to workshops and training courses. Otherwise, it would have been rather difficult for Romanian experts to participate in some of these activities due to the budgetary constraints within the central authorities and research institutes.

One of the first capacity building projects after Marrakech started in January 2001 and was financed by the Greek Ministry for Environment, Physical Planning and Public Works. It consisted of improving the climate change activities in the Balkan countries, like Romania, Bulgaria, etc. The main objective was to increase the participation of these countries in the international efforts regarding climate change mitigation and to strengthen the co-operation on these issues.

Based on some bilateral agreements related to the development of Joint Implementation projects, there were some capacity building activities and programmes developed by different countries, such as the cooperation with Norway based on the programme "Combined capacity building and project development" implemented in 2002 by the Norwegian Energy Efficiency Group (NEEG). The goal of the programme was to train about 30 Romanian facility managers, project developers and specialists regarding the development of business plans for climate change mitigation projects suitable for participating under the Joint Implementation mechanism.

In 2003, the Regional Environmental Center for Central and Eastern Europe financed a project for developing the "National Action Plan on Climate Change" (NAPCC) – 1st phase "Drafting the methodology and structure of the NAPCC". The project's main scope was to facilitate the implementation in Romania of the principles and objectives of the UNFCCC and to increase the central authorities' awareness on the commitments taken under the Kyoto Protocol. The outcomes of the project were presented in a Methodological Guide covering the steps for developing the NAPCC, the existing studies and projects, and the existing legal background.

In January 2004, the United Nations Development Programme and the Global Environment Facility started the project "Romanian National Capacity Self-

Assessment for Global Environment Management (NCSA)" having the overall objective to enable Romania identifying priorities and needs for capacity building to address global environmental issues, in particular those pertaining to the so called "Rio Conventions" (biological diversity, climate change, and desertification). The NCSA explored the synergies among these Conventions, as well as linkages with wider concerns of environmental management and sustainable development. The project represented the starting point for a long-term process, which will strengthen thematic and cross-cutting programmes under the Rio Conventions.

One of the most important NGOs in Romania in the field of climate change implemented a programme financed by the Regional Environmental Center for Central and Eastern Europe**,** named "Support for the Implementation of the Kyoto Protocol". The project was carried out at a regional level in six countries from the Central and Eastern Europe in the period October 2002 – March 2003 and focused on the possibilities for developing the GHG registry. Comparing the international requirements for GHG national registries with the existing situation in Romania resulted in the need for Romania to fulfill a number of prerequisites, in order to be able to implement successfully and operate the registry.

The Government of France financed a project accomplished by the Ministry of Economy and Trade of Romania in cooperation with two consultancy companies in the period June 2003 – March 2004. The key objectives of the project were represented by the development of some GHG emissions inventories in certain sectors of the Romanian industry, using a "bottom-up" approach and assessing the potential CO_2 reductions in order to assist the Romanian industry to maximize the value of its "carbon assets".

Based on the Memorandum of Understanding signed in 2003 between Romania and Denmark regarding Joint Implementation and climate change activities, the Danish Environmental Protection Agency (DEPA) accepted the requests of the Romanian Ministry of Environment and Water Management regarding strengthening of the capacity in this field. In the last period three of the most important activities were developed with the financial support from DEPA thus contributing to address the commitments taken under the UNFCCC and the Kyoto Protocol:

- development of the National Strategy and Action Plan on Climate Change;
- editing, publishing and printing of the NCIII;
- establishment and operation of the National Registry.

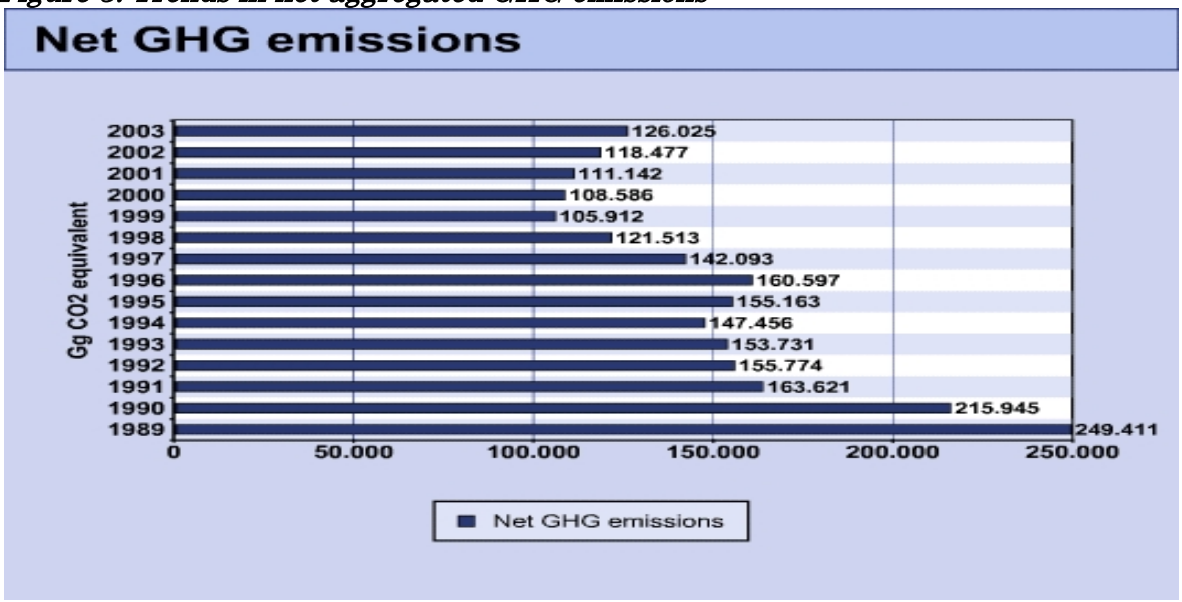
The capacity building needs in Romania still represent an important issue taking also into account the establishment in 2003 of the National Agency for Environmental Protection, which will be responsible for the implementation of all climate change activities in the near future. In the short and medium term, Romania needs to be supported with capacity building activities to comply with its commitments under the UNFCCC and Kyoto Protocol, based on the priorities mentioned in the National Strategy and Action Plan on Climate Change.

2. TRENDS IN, AND PROJECTIONS OF, GHG EMISSIONS

TRENDS IN GHG EMISSIONS

In accordance with the Kyoto Protocol, Romania has committed itself to reduce the GHG emissions by 8% in the period 2008-2012 comparing with the base year 1989. The total GHG emissions (without considering sinks) decreased with 46% in the period 1989-2003, and the net GHG emissions (taking into account the CO_2 removals) decreased with 49.5% in the same period. Based on these observations, there is a great probability for Romania to meet the commitment to reduce the GHG emissions in the first commitment period 2008-2012.

Figure 3. Trends in net aggregated GHG emissions



Trends by gas

All GHG emissions decreased comparing with the reference year. The decrease of CO_2 emissions is mainly 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 construction sectors). Next table presents GHG emissions in the base year compared with the year 2003 as well as their share in annual total, based on the last GHG inventory submitted in May 2005.

Table 1. Trends by gas (Gg CO_2 equivalent)

GHG	1989	2003	1989	2003
	Gg CO_2 equivalent		%	
Total*	265,124.36	142,904.79	100	100
CO_2*	184,248.01	111,392.77	69.5	77.9
CH_4	50,892.44	23,780.82	19.2	16.6
N_2O	29,199.25	7161.41	11.0	5.1
HFCs	0	3.51	0	0.002
PFCs	784.91	567.38	0.29	0.39
SF_6	0	0.00012	0	0

* excluding net CO_2 from LULUCF

The CO_2 emissions decrease (39.5% comparing with the base year) is caused by the decrease of fuel burnt in combustion activities. The methane emissions, related to the fugitive emissions from fossil fuels extraction and distribution and also to the livestock population trend, declined along the same period. The CH_4 emissions estimated for the year 2003 decreased with 53.3% comparing with the methane emissions in the year 1989.

The N_2O emissions are mainly provided by the "Agriculture" sector in the Agricultural Soils and "Industrial processes" sector in the Chemical industry. The decline of these activities is reflected in the N_2O emissions trends. The decrease in N_2O emissions (75.4% comparing with the base year) in this period is the highest observed for all gases.

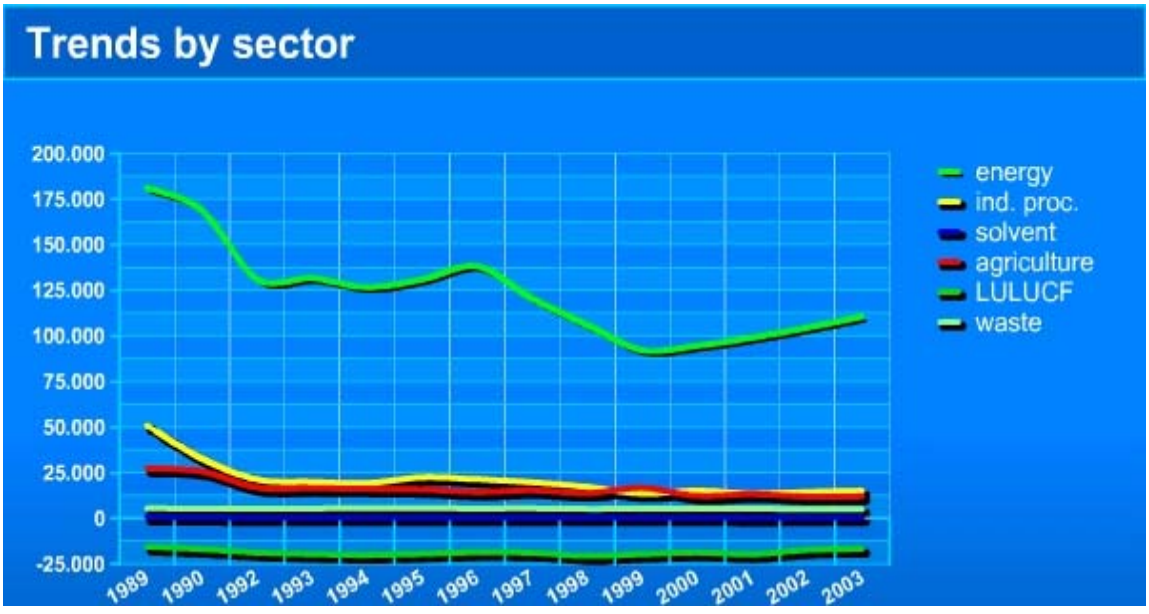
In the case of F-gases it is difficult to discuss about any trend, because the HFCs, PFCs and SF_6 emissions were estimated starting with 1995, based on consumption of these gases, and the PFCs emissions occurring from aluminum.

<u>Trends by sector</u>

The figure below shows the GHG emissions trends by sector. The GHG emissions resulted in the energy sector decreased with 39%; the GHG emissions from the industrial processes sector decreased with 70.4%; the GHG emissions resulted in the agriculture sector decreased with 56.6%; the CO_2 removals increased with 7.43%; and the GHG emissions from waste sector decreased with 5.4%, all compared with the base year.

The trends of indirect gases are similar with the GHG trends, except for CO emissions, which strongly increased starting with 1994, due to the raise of the firewood used in households

Figure 4. Trends by sector



PROJECTIONS OF GHG EMISSIONS

The emission projections in Romania are influenced by the uncertainties related to the privatization process and the continuous efforts for the approximation of national legislation with the EU acquis communautaire. The evolution of the economic activity in the period passed from 1989 was very much influenced by the important changes at the political and social level that occurred when Romania entered into the transition period towards a market-orientated economy.

The Romanian Government took the appropriate measures so that the negative economic trend finally stopped after 1999. Since 2000, the economic activity has been undergoing a revitalization process through a slight increase in economic growth, a reduction of the inflation and unemployment rates, an improvement of the main macroeconomic indicators and financial balance, and an acceleration of the privatization process. After 2000, the Romanian Government's policy was to support an accelerated growth of the GDP in the view of achieving the strategic objective of the economic discrepancy reduction between Romania and the EU member states.

As presented in the NCIII, submitted in 2005, the assumptions for the projections were considered in accordance with the economical situation in the period 2000-2003, the "Road Map for the energy sector of Romania" and the "Romanian Government strategy for the period 2004-2025".

The projections were based on calculations carried out using the ENPEP (Energy and Power Evaluation Program) package program, developed by Argonne National Laboratory of US Department of Energy (DOE) and distributed to Romania by the International Atomic Energy Agency (IAEA). The main models used are MAED (Model for Analyses of Energy Demand), WASP (Wiener Automatic Simulation Program), BALANCE and IMPACT.

Macroeconomic and energy indicators of Romania for the period 1998-2020 together with the possible measures for the reduction of GHG emissions were used in order to estimate the projections of GHG emissions for the period 2005-2020, using the following scenarios:

- "without measures" scenario;
- "with measures" scenario;
- "with additional measures" scenario.

The starting point for the projections calculation was represented by the information included in the National GHG Inventory of Romania, submitted in 2003 and the provisional data for the 2004 submission.

The possible evolution of the GHG emissions has been determined for both energy and non-energy sectors. The following sub-sectors have been analyzed in the energy sector:

- energy supply from Romania and imports;
- energy conversion - refineries, coke factories, electricity and heat production;
- energy consumers.

The following fields of activity have been studied for the non-energy sectors:

- agriculture - CH_4 emissions from enteric fermentation and manure management and N_2O emissions from using natural and chemical fertilizers;
- industry - emissions resulting from industrial processes;
- forestry - atmospheric carbon sequestration options;
- waste - management options for liquid and solid waste.

The forecast of GHG emission has been determined taking into consideration the various hypotheses related to the evolution of activities in the energy sector, which is the most important in the overall GHG emissions in Romania, and the other non-energy sectors.

The measures for the GHG emissions reduction have been established on each activity sector taking into consideration various options, but different indirect measures to be developed in the future could have an important effect on Romania's GHG emissions.

The aggregated emissions projections of all GHG are presented in the next tables and figures for all scenarios.

Table 2. Aggregated GHG Emissions (CO_2 eq.) for "without measures" scenario

Gg Carbon Dioxide Equivalent/year

Parameter	1998	1999	2000	2001	2002	2005	2010	2015	2020
Total CO_2 emission	89487.59	73388.34	76891.86	80218.13	89669.69	98500.00	110000.00	117950.00	129000.00
Total CH_4 emission	31213.49	30028.92	30015.44	29288.77	28378.35	30270.98	32653.35	34287.75	35532.11
Total N_2O emission	6128.0	6800.0	6768.0	7235.2	6262.4	6828.8	7603.2	8220.8	8582.4
Total PFC emission	488.69	477.06	503.23	508.08	525.06	550.0	570.0	590.0	600.0
Total aggregated emissions	**127317.77**	**110694.32**	**114178.53**	**117250.18**	**124835.50**	**136149.78**	**150826.55**	**161048.55**	**173714.51**

Table 3. Aggregated GHG Emissions (CO_2 eq.) for "with measures" scenario

Gg Carbon Dioxide Equivalent/year

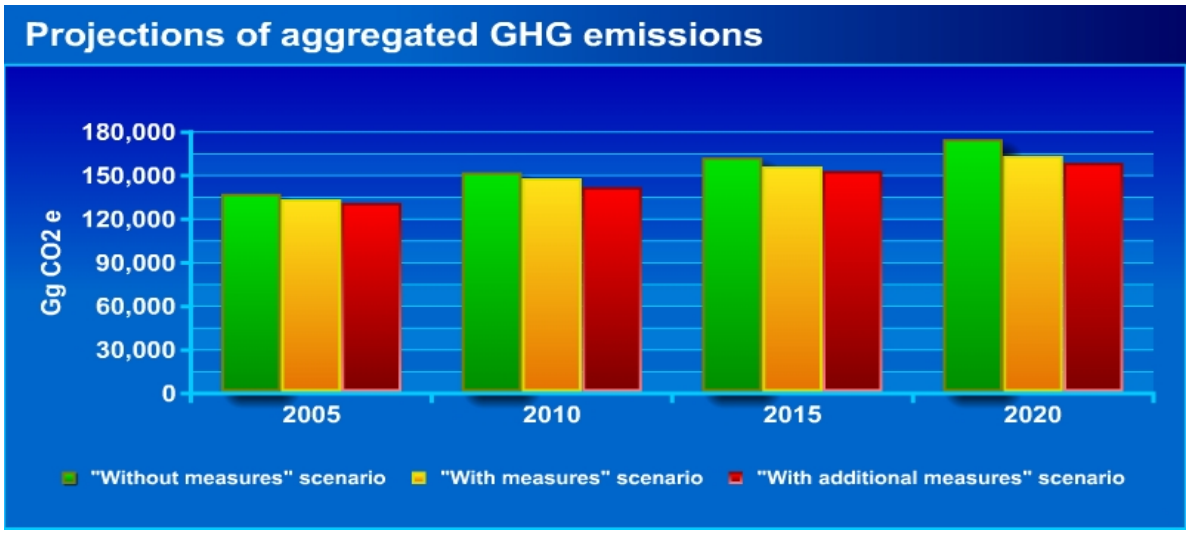
Parameter	1998	1999	2000	2001	2002	2005	2010	2015	2020
Total CO_2 emission	89487.59	73388.34	76891.86	80218.13	89669.69	95200.00	107200.00	113550.00	119200.00
Total CH_4 emission	31213.49	30028.92	30015.44	29288.77	28378.35	29998.5	31707.9	33108.8	34305.9
Total N_2O emission	6128.0	6800.0	6768.0	7235.2	6262.4	6694.4	7340.8	7830.4	8192.0
Total PFC emission	488.69	477.06	503.23	508.08	525.06	550.0	570.0	590.0	600.0
Total aggregated emissions	**127317.77**	**110694.32**	**114178.53**	**117250.18**	**124835.50**	**132442.90**	**146818.70**	**155079.20**	**162297.90**

Table 4. Aggregated GHG Emissions (CO_2 eq.) for "with additional measures" scenario

Gg Carbon Dioxide Equivalent/year

Parameter	1998	1999	2000	2001	2002	2005	2010	2015	2020
Total CO_2 emission	89487.59	73388.34	76891.86	80218.13	89669.69	93100.00	101950.00	111400.00	115350.00
Total CH_4 emission	31213.49	30028.92	30015.44	29288.77	28378.35	29620.3	31040.0	32283.4	33395.7
Total N_2O emission	6128.0	6800.0	6768.0	7235.2	6262.4	6544.0	7104.0	7564.8	7990.4
Total PFC emission	488.69	477.06	503.23	508.08	525.06	550.0	570.0	590.0	660.0
Total aggregated emissions	**127317.77**	**110694.32**	**114178.53**	**117250.18**	**124835.50**	**129814.30**	**140664.00**	**151838.20**	**157396.10**

Figure 6. Projections of aggregated GHG emissions



The total GHG emissions level in 2020 for all scenarios will not exceed the aggregated net emissions level of the base year (1989) of 249,411 Gg CO_2 eq. although all projections show an increasing trend taking into consideration the Romanian Government's efforts regarding the economic growth and also the harmonization with the EU acquis communautaire in the social and economic fields.

The projections of aggregated GHG emissions presented in tables 3 – 5 and in figure 6 have been calculated taking into account the CO_2 removals, due to carbon sequestration.

The next table presents the projections of CO_2 removals for all scenarios, established on the basis of the GHG inventory submitted in 2004, taking also into consideration the various measures for the increase of carbon sequestration potential.

Table 5. Projections of CO_2 removals

Gg

Year / Scenario	1998	1999	2000	2001	2002	2005	2010	2015	2020
"Without measures"	19518.99	18411.67	17684.97	18541.20	15971.54	16500.0	17500.0	18050.0	18500.0
"With measures"	19518.99	18411.67	17684.97	18541.20	15971.54	16800.0	17800.0	18450.0	18800.0
"With additional measures"	19518.99	18411.67	17684.97	18541.20	15971.54	16900.0	18050.0	18600.0	19050.0

3. EVALUATION OF THE CONTRIBUTION OF DOMESTIC MEASURES AND THE USE OF FLEXIBLE MECHANISMS

In the recent years, Romania was preparing for a complex process of integration in the European Union by reviving the economic development within the international context. Domestic measures developed for reducing the GHG emissions were very limited in the last period due to the large decrease experienced in the 15 years of transition to a market economy. However, a lot of policies and measures implemented in this period had an indirect effect on the GHG emissions trend. A substantive potential still remains to be exploited. The specific objective adopted in the NSCC is to continue implementing the existing domestic policies and measures to reduce the carbon intensity of the Romanian economy in full compliance with the EU acquis communautaire.

The need for Romania to undertake GHG mitigation measures is limited given the current GHG emission level and the expected emissions trend. It is very likely that Romania will meet its Kyoto Protocol target even under a strong emission growth scenario. Implementing domestic climate change measures are, however, also driven by other factors like:

- the commitments under the UNFCCC, the Kyoto Protocol and the EU accession require a proactive approach to mitigate GHG emissions, particularly, the transposition and implementation of many EU Directives in the energy and other sectors;
- the national and EU regulation require specific actions;
- various climate change measures will lead directly or indirectly to an efficiency improvement and contribute to the long-term competitiveness of the Romanian economy.

GHG emissions stabilization is one of the most important activities presented in the Romanian Strategy on Atmosphere Protection. This Strategy is one of the evidences of the commitment made by Romania to meet its target for 8% reducing of GHG emissions in the period 2008 – 2012 comparing to the 1989 levels. Policies and measures to reduce CO_2 and other GHG emissions will lead to indirect benefits, including improvement in air quality. Some measures targeted at reducing GHG emissions have the additional benefits of reducing emissions of pollutants that are harmful to human health and environment. The transfer to more efficient forms of energy production, improvement in transportation system, such as better public transportation and better engine technology for private and commercial vehicles, all result in reductions of GHG emissions, but also lead to reductions in pollutants such as nitrogen dioxide, carbon monoxide and particulates that have a proven adverse impact on human health.

The NCIII provides an overview of those existing policies and measures in the different economic sectors in Romania that directly or indirectly reduce the carbon intensity. Many are driven by the requirements for transposing and implementing EU regulations. Several studies have identified a range of new measures whose implementation, however, has been hampered by the lack of financial resources.

The table below summarizes key policies presented in the NCIII. No quantified emission savings by policy were given, though information on all sectors was provided.

Table 7. Major policies and measures developed in Romania

Energy Sector
Governmental program for the energy sector: restructuring the energy system by establishing integrated power plants for production of electricity and heat.
Governmental program for the energy sector: privatization in the energy field will cover the production and distribution of energy by increasing the capital and stock exchange quotation. This will lead to an increased security in the energy sector.
Start operation of the second reactor of the Cernavoda nuclear power plant (2006-2007) and of the third group in 2010-2015.
Policy aim to modernize the coal industry to make it more efficient resulting in encouraging mine privatization, improving the economic performance, and closing of non-feasible mines.
Strategy for the energy sector and for energy efficiency which aims to secure energy supply, promote renewable energy sources, apply environmental protection.
Energy projects considered in the future: additional hydro generation capacity, lignite based power generation, Combined cycle gas turbines.
Efficient electricity generation measures will make the national energy systems operators more competitive and efficient.
Industrial processes
Key policies focused on extending the process of redesigning industrial capacity and structure, including development and completing the privatization of industrial companies aiming to increase industry efficiency and competitiveness.
Transport
Completing the modernization of the Pan European transport corridor IV and a series of policies and measures to address the road infrastructure problems.
Agriculture
Introducing new technologies and modernizing the agricultural units and also applying structural adjustments in the agricultural sector. Agricultural reform was structured on three pillars: reorganization, restructuring and privatization.
Waste management
National waste strategy and national plan for waste management was developed in the last period. Policies include waste reduction, material re-use, integrated management plans and reducing hazardous waste trans-boundary movement.
Forestry
The afforestation rate was increased at the national level by implementing different activities like information system on forests, certification of planting materials, fire prevention etc.

Since 2001 the Romanian Government has made significant progress in the promotion of environmental management and harmonization of environmental legislation with the EU. Transposition and implementation of the EU environmental acquis communautaire is a complex process due to its cross-sectoral nature and the potential impact on the Romanian economy, caused by bringing environmental standards in line with the EU ones. The process involves significant costs and structural changes in the Romanian economy.

The first long-term objective of the EU strategy is to mitigate climate change, firstly by meeting the commitments taken under the Kyoto Protocol and then by reducing GHG emissions up to 2020 by an average of 1% annually, compared with 1990 levels. These and further developments at EU level will have to be taken into account as these strategies evolves over time.

The EU policy regarding emission reduction activities is coordinated within the framework of the European Climate Change Programme (ECCP). Most of the policies and measures are implemented at the national level as part of the Member States' policy to meet the Kyoto Protocol targets.

The NSCC and NAPCC adopted as two Governmental Decisions, serve as the road map in this field, reflecting the strategic considerations, and practical steps that Romania will undertake, considering the commitments under the UNFCCC, the Kyoto Protocol and the EU integration.

Given the state of the Romanian economy, the focus was on those policies and measures that require a limited contribution from the state budget only and that show economic side-benefits. Also, the policies and measures included in the NAPCC are limited to those that have a large potential impact on emissions and that can realistically be implemented in the period 2006-2007.

The following seven key policies and measures have been selected and addressed in specific actions which are included in the NAPCC:

- *Increasing Romania's participation in the "Intelligent Energy for Europe" Programme (IEE)*

  The IEE Programme is the European Community's support programme for non-technological actions in the field of energy efficiency and renewable energy sources. The first priority is to improve the coordination of Romania's participation and to improve the communication between the projects and policy makers. Ministry of Economy and Commerce (MEC) will evaluate the current IEE programme in Romania and further specify the priorities for improvements. Assessment of potential increase in co-financing may be necessary and become available in the year 2007.

- *Promoting renewable electricity production*

  Renewable energy is strongly promoted at the EU level as a key measure to reduce GHG emissions, although most of the measures are to be taken at the level of the Member States. MEC will implement a capacity building project for market intermediaries and project developers with financial support from the IEE Programme securing the required co-financing. MEC will evaluate the system of Tradable Green Certificates by mid 2007 and new financing mechanisms for renewable energy projects could be introduced.

- *Promoting energy efficiency in energy end-users*

  The following actions are to be implemented in the next period: implementing a capacity building project for market intermediaries and project developers in energy efficiency, securing the required co-financing, introducing new financing mechanisms for energy efficiency projects. If necessary, legislative

provisions and national regulations which hamper or restrict the use of financial instruments and contracts for making energy savings will be repealed or amended.

- *Promotion of co-generation and energy efficiency in district heating*
  Due to the overall Romanian economical decrease and the restructuring of the energy sector in the last decade, the CHP facilities in the district-heating sector produce at low efficiency. The lack of investment funds for rehabilitation and modernization and the insufficient policies on CHPs have resulted in the current state of the systems. Some further actions are related to the preparation of a long-term strategy for co-generation and district heating, the provision of financial incentives for energy efficiency projects in district heating, and the strengthening of the local administration capacity in energy planning.

- *Managing GHG emissions from transport sector*
  The transport sector has registered the highest increase of GHG emissions in recent years in Romania. The NAPCC priority is to establish a structural policy and financial framework as well as the required capacity for the implementation of policies and measures to manage GHG emissions in the transportation sector. Review of the existing transport strategy, implementing capacity building programmes together with improvement of the GHG inventories and scenarios for the transportation sector will be carried out in the next period.

- *Promotion of energy recovery by using landfill gas*
  Methane emissions from solid waste disposal on land dominate the waste sector. Some actions for the promotion of energy use from landfill gas will be carried out in the next period like the compulsory investigation on the feasibility of energy use of the biogas, providing support for project developers with the identification of sites and establishing a national inventory of potentially available biogas quantities in landfills.

- *Land use, land use change, and forestry (LULUCF). Introduction of integrated land-use systems*
  Forestry and land-use practices hold considerable potential for offsetting GHG emissions. A wide range of policies and measures can be identified in this field. On the short term integrated land use systems should be promoted at a local and regional level, which would allow for the sustainable use of land supported by the introduction of good practice guidance and codes. The clarification of land-use definitions represents also a related requirement for the introduction of integrated land-use systems.

IMPLEMENTATION OF THE KYOTO PROTOCOL'S FLEXIBLE MECHANISMS

Based on the provisions of the UNFCCC and its Kyoto Protocol, Romania started a series of bilateral co-operation programmes with various Annex I Parties (Switzerland, the Netherlands, Norway, Denmark, Austria, Sweden, and France) and the World Bank through the Prototype Carbon Fund (PCF). There are 8 Memoranda of Understanding on co-operation under Article 6 of the Kyoto Protocol for Joint

Implementation (JI) projects between Romania and the aforementioned countries and a Host Country Agreement with the World Bank. These Memoranda provide the legal framework for implementing JI projects aiming at reducing the GHG emissions in Romania and improving in the same time some social aspects of life by developing such projects in areas where problems exist and where a lack of financing for these problems is observed. Other Annex I Parties are interested in developing JI projects in Romania and the appropriate procedure for the conclusion of the Memoranda of Understanding with these countries has already been started.

Based on the existing Memoranda, Romania has already approved 12 JI projects, which are in different stages of development or even finished. These important investments will generate about 8 million emission reduction units (ERUs) in the first commitment period of the Kyoto Protocol.

The approved 12 JI projects break down by project type as follows:

- 5 energy efficiency projects, of which:
  - 4 rehabilitation (5 DHS), including 2 co-generation projects;
  - 1 industrial technology improvement, including 2 cement plants.

- 4 renewable energy projects, of which:
  - 2 hydropower plants;
  - 1 biomass (sawdust), including 5 DHS;
  - 1 geothermal, including 2 DHS.

- 2 landfill gas recovery projects, including 6 municipal landfills;

- 1 afforestation project (the only LULUCF related JI project in the world).

Table 8. Joint Implementation Projects in Romania

No	*PROJECT*	*AGREEMENT*
1.	Thermal Energy Project in Buzau & Pascani (AIJ)	MoU Switzerland
2.	Rehabilitation of DH System in Fagaras	MoU Norway
3.	Modernization of 3 Hydro Units in Portile de Fier I Hydro station	ERUPT 2-Netherlands
4.	Refurbishing of 2 Cement Plants	ERUPT 2-Netherlands
5.	Modernization of 4 Hydro Units in Portile de Fier II Hydro station	ERUPT 3-Netherlands
6.	'Sawdust 2000'	MoU Denmark
7.	Geothermal Energy Use in Oradea - Area 2 and Beius DH Systems	MoU Denmark
8.	Afforestation of ~7000 ha Degraded Agricultural Soils	HCA with PCF
9.	Municipal Cogeneration at DH System Targoviste	ERUPT 4-Netherlands
10.	Landfill Gas Recovery at 4 Municipal Waste Deposits	ERUPT 4-Netherlands
11.	Rehabilitation of CET Timisoara Sud	MoU Sweden
12.	Landfill Gas Recovery at 2 Municipal Waste Deposits	MoU Denmark

The NSCC specific objective related to securing Romania's future participation in the flexible mechanisms provided by the Kyoto Protocol (JI and IET) to the maximum benefit of the environment and economy, will be achieved in the next period through implementation of the following six actions presented in the NAPCC:

- Developing the guidelines for JI Track II project preparation and approval;
- Establishing the procedure for JI Track I project approval;
- Developing and approving the eligibility criteria and priority areas for JI;
- Establishing the framework and assisting the implementation of a Green Investment Scheme – GIS;
- Implementing a GIS.

Besides these actions, some activities related to awareness raising among key stakeholders are needed regarding JI and GIS, their opportunities and their requirements. The simple approach regarding these activities consists of organizing conferences, workshops and seminars for representatives in the energy, industry, agriculture, forestry and other relevant sectors, including the relevant governmental institutions, and preparing targeted information materials.

4. DESCRIPTION OF THE PROGRESS IN OTHER COMMITMENTS

NATIONAL SYSTEM FOR ESTIMATING ANTHROPOGENIC GHG EMISSIONS

Background information

As a Party to the UNFCCC, Romania is required to produce and regularly update the National GHG Inventory. Until now, Romania succeeded in producing the GHG inventories for the years covered by the period 1989-2003 together with the National Inventory Reports (NIR) containing detailed and complete information on the inventory planning, preparation and management.

The inventories submitted by the MEWM every year from 2002 have been annually reviewed under the UNFCCC by international expert review teams. Romania's GHG Inventory has been reviewed by an in-country review in 2003, followed by a desk review in 2004 and a centralized review in 2005. The review reports can be found on the UNFCCC Secretariat website.

For the last submission from 2005, Romania prepared the CFR Reporter database including inventories recalculated for all years, and CRF LULUCF tables containing emission estimates for the period 1989-2003 together with the National Inventory Report.

Institutional arrangements

ICIM Bucharest prepares the GHG emissions inventories under annual contracts with the MEWM. From the last submission, NEPA is also involved in the inventory preparation, regarding mostly the activities related to data collection.

Contacts are established with ministries, research institutes, organizations and companies that are requested to provide the necessary data for the inventory preparation. The 42 local Environmental Protection Agencies are used in some cases as a source of bottom-up data for the inventory (in case of some HFCs, PFCs and SF_6 consumption). Moreover, the LULUCF sector is been prepared by the Institute for Forest Research and Management (ICAS Bucharest), under a contract with ICIM Bucharest.

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 2002, MEWM signed a protocol of co-operation with NIS. Under this protocol, NIS agreed to provide up-front additional data in written form if the necessary data has not been published in the National Statistical Yearbook or in the Energy Balance. There are still some problems with the timing regarding activity data that are to be resolved for the next submissions.

Inventory preparation

The GHG inventory for the period 1989-2003 presented in the last submission and, in general all inventories submitted until now were compiled according to the recommendations for inventories set out in the UNFCCC Guidelines on Reporting and Review (FCCC/CP/2002/8 and FCCC/SBSTA/2004/8) and the NIR included detailed information on the inventories for all years in the period 1989-2003, in order to ensure the transparency of the inventory.

The emissions are estimated using "Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories" (IPCC, 1996), as well as the "IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories "(IPCC GPG 2000) and "IPCC Good Practice Guidance for Land Use, Land-Use Change and Forestry" (IPCC GPG LULUCF 2003).

The sources of emission factors used are: IPCC 1996, IPCC GPG 2000 and very limited country-specific or plant-specific. The methods used to estimate emissions are mostly Tier 1, Tier 2 for some energy and industrial processes sources and CORINAIR in case of solvents and other product use.

There is no formal quality assurance/quality control (QA/QC) plan in place. The specific procedure to be developed based on the NAPCC for the national system for the estimation of GHG emissions will outline the QA/QC plan. In the preparation of annual GHG emission inventory several quality control (QC) procedures are carried out already.

Romania has not estimated yet the quantitative uncertainty as described in the "IPCC Good Practice Guidance". IPCC GPG provided for some uncertainty estimates associated with emission factors, but those associated with activity data are not estimated since the official statistics have not provided the uncertainty values.

The national GHG inventory covers all sectors and almost all the IPCC source categories. Emissions are presented by sector, by sub-sector and by gas. There are still some gaps in the inventory related to activity data not available.

National System

Based on art. 5 of the Kyoto Protocol, Romania will establish a national system to estimate anthropogenic emissions for all GHGs not covered by the Montreal Protocol. The system should comply with the subsequent decisions of the COP/MOPs of the Kyoto Protocol and the EU Decision 280/2004/EC on a mechanism for monitoring GHG emissions. Romania has regularly prepared and submitted annually the GHG inventory, based on a clear internal plan and structure but the national system still needs to be improved.

MEWM, together with ICIM, ICAS and NEPA are working together for improving the national system for the estimation of GHG emissions based on the NAPCC. This will be done within the framework of the national system for integrated air quality assessment and management, set up by the Governmental Decision no. 586/2004. The system ensures the organizational, institutional and legal framework for cooperation between authorities and public institutions that have competences in atmosphere protection and air quality assessment and management in Romania. The following three stages will be considered in the elaboration of the inventory: planning, preparation and management. In the first stage specific responsibilities will be defined and allocated, the second stage refers to inventory preparation process (data collection, relevant information needed for estimating emissions, methodological choices) and the third stage refers to the inventory management that also includes quality management, as well as documentation on QA/QC activities.

Establishment of the national system for estimating anthropogenic GHG emissions represents one of the eligibility criteria for the Romanian participation in the flexible mechanism (JI track 1 and IET) under the Kyoto Protocol. As provided by the NAPCC, the national system will be fully operational by September 2006.

Though in Romania a system has been used in the last four years for preparation of the national inventories, a specific procedure has not been approved yet. Based on the NAPCC, further clarification in terms of division of competences and designation of responsible institutions needs to take place. Until September 2006, Romania will establish a specific procedure for the national system, thus setting up the framework for formatting, collecting, processing and presentation of data on the activities and information necessary for the preparation of the national inventory.

Though the quality of estimation in the Romanian inventory has been gradually improved based on the recommendations from the 2003 in-country review, some aspects still need to be improved according to the latest review report. Based on the recommendations from the last reviews, Romania will need to introduce in the next period more national emission factors and national methods for calculation of emission values in different sectors such as energy, agriculture, LULUCF at least for the key categories.

When Romania joins the EU, reporting shall take place to the European Commission no later than 15 January each year in accordance with Art. 3 (1) of the Decision 280/2004/EC. The full National Inventory Report shall be submitted not later than 15 March each year. The data from the Member States feed into the annual EU GHG Inventory.

NATIONAL REGISTRY

According to the NSCC and NAPCC, Romania as a Party included in Annex B of the Kyoto Protocol will establish the National Registry by September 2006, being also one of the eligibility criteria for participating in implementing the flexible mechanisms of the Kyoto Protocol and the EU ETS. The purpose of the registry is to ensure the accurate accounting of the issuance, holding, transfer, acquisition, cancellation and withdrawal of assigned amount units (AAUs), removal units (RMUs), emissions reduction units (ERUs), and certified emission reductions (CERs), as well as the carry over of these units. Furthermore, the Kyoto Registry should be combined with the EU ETS Registry required by the EU ETS Directive resulting in a unique National Registry.

Romania will have to set up the National Registry, complying with the basic registry requirements as defined in the UNFCCC Decision 19/CP.7 as well as with the technical data requirements in UNFCCC Decision 24/CP.8. Furthermore, it should comply with the requirements for the EU ETS registries as elaborated by the European Commission and presented in the Commission Decision 2216/2004/CE.

MEWM has appointed NEPA as the national registry administrator. MEWM has successfully applied for technical and financial assistance from the Danish Government (DEPA) to support the development of the national registry. Besides this, additional financial resources will be allocated from the national budget in order to ensure that the registry is established on a hardware system complying with international safety regulations in this area, if the internal hosting is decided. Another possibility could be to host the registry system externally, taking into account that Romania uses the GRETA software.

The first focus of the support programme is to set up a detailed registry implementation plan which will result in an operational registry. Drafting of protocols and regulations for the registry administrator will subsequently take place, based on the implementation plan. Training of administrator staff and MEWM officials, as well as testing, pilot operation and updating of the system are included in the same support programme.

IMPACTS, VULNERABILITY AND ADAPTATION

As stated in the NSCC, future changes in regional and local climate conditions will influence ecosystems as well as man-made settlements and infrastructure in Romania. Shifts in temperature and precipitation are expected, together with more frequent extreme weather events (storms, floods, and droughts) which are likely to make climate-related risks and damages become more significant. The most relevant possible impacts of climate change in Romania are: modification of vegetation periods, displacement of ecosystems, prolonged droughts, floods. Sectors potentially affected include agriculture, transports, energy supply, water management, health and households.

According to the NSCC, the specific objective will be to limit the long-term economic, environmental and social costs of the climate change impacts in Romania. The knowledge on impacts of climate change, vulnerability and adaptation must be

increased in order to achieve this objective. Based on this improved knowledge, no-regret and cost-effective precautionary adaptation policies and measures are to be identified and prioritized. In the period 2006-2007, will be implemented only high priority policies and measures regarding adaptation.

The NSCC recognizes the importance of involving regional and local authorities, as these play an important role in areas such as urban planning and infrastructure and in the future will need to elaborate and implement targeted climate change actions at municipal level.

Impacts, Vulnerability and Adaptation in the European Union

Romania's accession to the European Union has several implications for the activities related to adaptation. At the EU level, there is growing focus on adaptation to climate change. This is reflected in the Commission's Communication from February 2005 "Winning the Battle against Global Climate Change", stating that the future EU climate strategy should include adaptation policies and that more resources should be allocated to the subject while the poorest and most hard hit countries should be supported.

From 2006, a new phase of the European Climate Change Programme (ECCP) will explore the EU role in reducing vulnerability and improve adaptation. Adaptation is also included in the EU considerations related to a long-term European strategy on climate change policy (post-2012). Under the EU Research Framework Programmes, a number of research projects related to climate change impacts and adaptation are being implemented, which will be relevant to Romania.

Recent work related to adaptation in Romania

Like most other countries, climate change impacts, vulnerability and adaptation have not been a major focus area in Romania in the past. Recent activities targeting the issue are briefly described below.

Most of the reporting related to impacts, vulnerability and adaptation presented in the NCIII is based on a study from 1997. Thus, there is a clear need for updating both the climate change scenarios and the assessments of impacts and vulnerability.

In NCIII, the likely climate change scenarios are based on global climate change models. These are used as a point of departure for assessing impacts and vulnerability within agriculture, forestry and water management. Other sectors are not covered, and overall the number of identified adaptation measures is limited.

Adaptation measures in NCIII are classified in two groups.

- Measures related to the national decision-making level, referring to governmental laws and other regulation regarding the protection, conservation and improvement of soil and water resources;

- Technical measures resulted from research studies. These may consist in e.g. recommendations for revised agricultural irrigation practices.

The National Capacity Self-Assessment (NCSA) study recently carried out in Romania with the GEF support presents a number of findings that are relevant to

Romania's capacity to deal with climate change adaptation.

Although adaptation has been addressed within agriculture, forests and water management, the study highlights that the national or sector strategies guiding the efforts to adapt to climate change impacts are still developing. There is also a limited institutional capacity to support planning and implementation of adaptation activities, except for water, agriculture and forestry management. The institutional responsibilities in relation to integrating climate change adaptation are also not clearly defined.

The NCSA identifies the need for operational procedures to ensure cooperation and coordination among institutions. According to the same project, the capacity to mobilize information and knowledge related to adaptation should be improved both at the central level and within the regional network of government institutions.

The Handbook for Preparation of the National Action Plan on Climate Change for Romania elaborated within the framework of a project supported by the Regional Environmental Centre contains several proposals for adaptation measures. The Handbook provides an assessment of impacts and outlines adaptation measures within the sectors agriculture, forestry and water management.

Thus, the coverage is the same as in the NCIII, reflecting the focus in the past on these sectors. The Handbook provides an assessment for each of the three sectors in terms of impact assessment, adaptation measures, R&D, information and education, and institutional capacity building. Several concrete measures were identified as adaptation options for the three sectors, which will be considered in future adaptation planning.

The objectives as set out in the NSCC will be achieved through implementation of the following actions provided in the NAPCC:

- Strengthen cooperation between authorities, institutes and other stakeholders
- Building the foundation for adaptation: Scenarios and scoping studies
- Urgent Action Programme for Adaptation (UAPA)
- Climate Change Adaptation Research Programme (CCARP)
- Decision Tools for Adaptation Planning

<u>Complying with commitments and adopting good practices</u>

Romania is committed to comply with the obligations under the UNFCCC and the Kyoto Protocol. In relation to climate change impacts and adaptation, these commitments are not very detailed and specific, and the main driver behind in the adaptation work is the national self interest of the country to minimize negative socio-economic and environmental consequences.

Another point of reference for the Romania's work on climate change adaptation is represented by the actions taken at the EU level, both jointly and by individual member states. Romania will also participate in information sharing

among EU/EEA member countries and contribute to the discussion on adaptation strategies and policies at EU level.

The adaptation planning will be incorporated within the context of current policies and build upon earlier national assessments including the National Communications to the UNFCCC, previous vulnerability and adaptation studies, and pilot projects.

The approach is also determined by the recognition that the current level of knowledge about future climate scenarios and their impacts, as well as possible adaptation measures is not sufficient to enable the development of a full-scale adaptation strategy and action plan for Romania in the short term. The fact that adaptation is a long-term process, requiring sustained consideration for many years was taken into account when developing the NSCC and NAPCC.

Romania's focus in relation to adaptation will be less on individual adaptation projects as a response to climate change, and more on integration of adaptation into key policy and planning processes. The responsible authorities will identify and implement a mix of policies and measures with the objective of reducing the country's vulnerability to climate change in accordance with the NSCC and NAPCC.

Romania is already facing the challenge of addressing the impacts of its vulnerability to the current climate conditions, e.g. in the form of droughts and floods impacts that are likely to increase in the future. Furthermore, important decisions with long-term impacts should be taken as soon as possible such as those regarding investments in infrastructure.

The uncertainty regarding the magnitude of future climate change effects, their impacts and the general development of the Romanian society contribute to the complexity of the response measures needed.

Romania will follow a phased approach as presented in NSCC and NAPCC:

1. Long-term adaptation challenges where the emphasis is to provide the fundamental level of knowledge and to analyze long-term effects over the coming decades, reaching as far as the end of the current century.

An *anticipatory* rather than a *reactive* approach to adaptation will be followed, meaning that sufficient knowledge and capacity will be developed to enable Romania predicting climate change impacts and take precautionary actions. In many cases, it is difficult or impossible to predict and assess the specific actions that will have to be taken in the future. Thus for the long term, more focus will be put on improving *"adaptive capacity"* to deal with whatever impacts might appear than on identifying individual actions.

2. Urgent adaptation measures will be taken in parallel with the long-term approach, by focusing on decisions needed in the next couple of years. The measures identified will have a short implementation time, but with immediate and, preferably, long term effects. Thus, in Romania a quick scoping exercise on vulnerability and adaptation will be carried out in order to identify high priority activities related to immediate and urgent adaptation needs addressing the most vulnerable systems and sectors.

SCIENTIFICAL AND RESEARCH ACTIVITIES

Science and technology research is to represent the basis of decision-making process concerning climate change issues, as observed in the NSCC and NAPCC. As mentioned in the NCIII, research activities related to climate change are not so developed in Romania being similar to other countries with economy in transition in the region due to the lack of financial resources. There are also some problems with communication and dissemination of research achievements like studies or reports that are focused on different activities in the field of climate change. In the last years, some studies related directly or indirectly with climate change were elaborated by some interested research institutes or NGOs.

The most important actors in the climate change related research are the MEWM, through its national research institutes (The National Research and Development Institute for Environmental Protection – ICIM Bucharest, the National Administration for Meteorology – ANM Bucharest and the National Institute for Hydrology and Water Management) and the Ministry of Education and Research (MER). Some research work on climate change related activities was also initiated by the Romanian Academy, the Academy of Agriculture and Forestry Sciences, the National Research and Development Institute for Marine Activities "Grigore Antipa", the National Institute for Geography, the National Institute for Statistics and the Research Institute for Agriculture, Agro-chemistry and Soil.

ICIM Bucharest is carrying out research activities regarding the elaboration of national GHG inventories, the establishment of national emission factors, and the assessment of possible technical measures for the GHG emissions mitigation or removals fostering. The National Communications of Romania to the UNFCCC Secretariat, coordinated by the MEWM were developed by ICIM Bucharest and the ANM Bucharest in close co-operation with several institutes.

The climate related research in Romania is mainly developed by the ANM Bucharest, which has a long history of weather related research activities. Meteorological scientific research of ANM focused on the main fields, selected as being of national interest and in accordance with the EU demands: atmospheric and pollutant transport modelling, physics of the atmosphere, ozone layer, climate studies (climate variability, climate change and impacts on crops, climate prediction), studies based on satellite, remote sensing and GIS techniques.

The main research directions approached in the climate variability and climate change field refer to a better understanding of the mechanisms controlling regional climate variability, extreme climate events analysis and climate change caused by anthropogenic activities (enhancement of greenhouse effect and aerosols concentration).

The agro-meteorological bulletins including the agro-meteorological forecast for the next period, warnings regarding the occurrence of agro-climatic hazard factors are published weekly and monthly, in order to have a current assessment of the agro-meteorological parameters effects on the soil condition and agricultural crops vegetation. Information is accompanied by useful recommendations, advising

the farmers in choosing the corresponding technological solutions to prevent and mitigate the severe weather effects on different critical vegetation stages of the crops. Longer-range agro-meteorological forecasts (based on long-range meteorological forecasts) are also elaborated allowing a perspective view on the influence of the agro-meteorological conditions evolution, upon the plants growth, development and productivity.

In the last years, ANM also continued the research activities regarding the development and improvement methods for assessing and predicting the climate variability impact (including extreme events) on the crops growth, development and formation.

Research activities in Romania cover also a wide range of climate processes and climate system studies included in the framework of the Climate Variability and Climate Prediction Project (CLIVAR) of the World Climate Research Programme (WCRP) and the International Geosphere-Biosphere Programme (IGBP), focusing especially on studies guided on regional scale.

The most important national research programs, which include climate change related studies, are: ORIZONT 2000 - funded by the MER and coordinated by ICIM; RESEARCH GRANTS PROGRAMME - financed by the Romanian Academy and the MER; METEOROLOGICAL AND HYDROLOGICAL RESEARCH PROGRAMME - financed by the MEWM; COST ACTION 718: "Meteorological Applications for Agriculture" (2000-2005) - supported by the European Science Foundation.

One of the most important issues in the international co-operation between the Romanian scientists and other international research centers, is related to the development of regional climate change scenarios. The ANM scientists were involved in these activities, which include mainly the developing of mathematical techniques to project the global climate changes at regional scale and to validate global climate models (GCMs) at regional scale.

The international co-operation is an important component of the meteorological activity, through which ANM participates both to the world observations and measurements system and to the international scientific research. The main activities can be grouped into 3 categories as presented in NCIII:

- International scientific collaboration programs;
- Bilateral scientific collaboration programs;
- Data Exchange programs within international organizations.

In the last couple of years the research related to climate change activities developed based on the co-operation between Romanian experts and international experts for developing research studies at the national and regional scale.

REFERENCES

- National Strategy of Romania on Climate Change (NSCC), approved 2005;
- National Action Plan of Romania on Climate Change (NAPCC), approved 2005;
- National GHG Inventory of Romania for 1989-2003, submitted in 2005;
- National Capacity Self-Assessment Report, published 2005;
- Report of the individual review of the GHG inventory submitted by Romania in 2004 (desk review), published 2005;
- Romanian Energy Balance for 1989-2003, published 2005;
- Third National Communication of Romania under the UNFCCC (NCIII), submitted in 2005;
- Statistical Yearbook of Romania for 1989–2003, published 2005.

Experts involved in the preparation of the Romania's Report on Demonstrable Progress in Implementing the Kyoto Protocol – 2005:

- Mr. Vlad Trusca, UNFCCC National Focal Point, MEWM
- Mrs. Dumitra Mereuta, Director MEWM
- Ms. Daniela Panait, Advisor MEWM