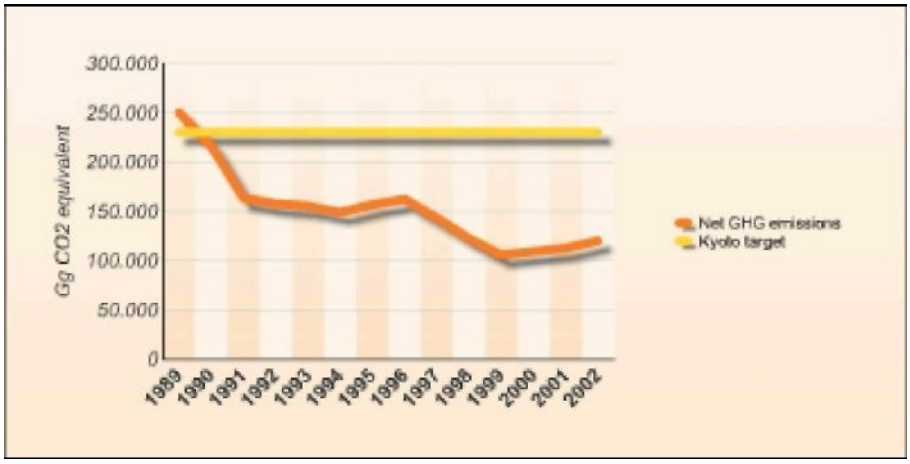
Climate Change & Built Environment in Romania

1. Introduction

- The phenomenon of global warming of the Earth of the last century, more accentuated in the last 25 years, has become a more and more serious concern for the entire population of the globe.
- The galloping industrialization, with massive consumptions of fossil fuels (oil, natural gases and coal) is the most important cause of the serious degradation of the quality of the atmosphere at a world level so that, in the current context of development, the greenhouse effect is difficult to be controlled. Romania is not exempt of the foreseeable changes in the world climate either.
- In Romania, the effects of the climate changes on agriculture, forestry, water management and human settlements represent an ever- important preoccupation.

2. The Romanian Legal, Political and Institutional Framework

- Romania ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 1994, by Law 24/1994 and signed the Kyoto Protocol in 1997 that was ratified in January 2001, by Law 3/2001.
- Simultaneously, steps were taken for harmonizing its policies with those of the European Union and for implementing the EU Directives.
- According to the provisions of the Kyoto Protocol, Romania bound itself to diminish the emissions of greenhouse gases (GHG) by 8% as compared to the levels in 1989 (the reference year) in the first commitment period 2008 –2012. The figure below presents the total GHG emissions in Romania in 1989 – 2002 as compared to the target value set by the Kyoto Protocol.



Total net GHG emissions in equivalent CO_2 in the period 1989 – 2002.

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The total net GHG emissions decreased by about 50% in 2002 as compared with the reference year 1989.

The decrease was mainly due to the strong decline of the industrial production and to the restructuring of the economy during the transition period towards a market economy. Finally, the putting in operation of the first reactor of the nuclear—electric station in the town of Cernavoda in 1996 had a significant impact on the GHG emissions.

- As regards the political framework, the Strategy of Romania in the field of environment is outlined by:

- *The National Strategy on Environment Protection*, in which the Climate Change are also mentioned;

- *Strategy and Plan of Action on Atmosphere Protection*, that develop in detail the policies of Romania related to the improvement of air quality:

- *National Strategy on Climate Change for Romania* (SNSC) that outlines the strategy of Romania for fulfilling the obligations within EU and UNFCCC as well as the benevolent activities of Romania in the field of climate changes;

- *The National Plan of Action for Climate Change* (PNASC) that includes the objectives set in SNSC, by identifying concrete policies and measures, the implementation actions of these policies and measures included.

SNSC interacts with the strategies of the Government of Romania from other fields and particularly takes into consideration the following documents:

- The Medium - Term National Strategy of Economic Development of Romania.
- The industrial policy of Romania.
- The route sheet for the energetic sector in the Romanian Government Decision HG no. 890/2003.
- The National Strategy with regard to Energetic Efficiency (HG no. 163/2004).
- Strategy on the recovery of renewable energy sources (HG no. 1535/2003).

3. National Strategy on Climate Change (SNSC) for Romania

- **The National Strategy on Climate Change (SNSC) for Romania** is the document that includes the main objectives in this field, such as:

  - Determining a policy, of an adequate legal and institutional framework, enabling the preparation and implementation of some policies and measures in the field of climate change;
  - Implementation of a national assessing system of the emissions and of removal of GHG emissions in full accordance with the requirements of UNFCCC and of EU until 1.1.2008;
  - Enabling the future participation of Romania in the flexible mechanisms within the Kyoto Protocol (JI – Joint Implementation and IET – International Emission Transfer) with a maximum benefit for the environment and economy of Romania in accordance with UNFCCC and the EU regulations and with a stable and transparent domestic policy and institutional and regulating framework;
  - Transposing and implementation of EU Directive of setting a scheme of GHG emission transfer allotted within the Community (2003/87/EC) and of the amendments brought by Directive 2004/101/EC, which acknowledges the credits of JI and CDM (Clean Development Mechanism) and makes possible their use within the scheme of emission transfer of the EU. Transposing and implementation are carried out in accordance with the national legislation and by providing the potential benefits for environment and economy of the emission transfer within the EU for Romania;
  - Limiting the economic and social costs of the effects of climate change in Romania by increasing the level of knowledge with regard to the impact, vulnerability and adapting to the climate change. Based on these information, precaution policies and measures for adapting purposes will be identified and rendered priority, with low costs and economic efficiency;
  - Extending inclusion of the aspects referring to climate change in education and research and increase of the level of awareness of the aspects referring to the climate change among the main involved factors from Romania.

➢ Referring to the implementation of UNFCCC and of the Kyoto Protocol, it should be underlined that article 5 of the Kyoto Protocol stipulates that all the Parties in Annex I UNFCCC are to set a national system of assessing the antropic emissions for all GHG that are not included in the Montreal Protocol. The system has to meet the requirements and decisions of UNFCCC authorities and Decision 280/2004/EC.

4. Modification of the Regional and Local Climate Conditions

➢ **The modification of the regional and local climate conditions** has influenced the ecosystems and the human settlements and the infrastructure from Romania. Temperature and precipitations, extreme meteorological events (storms, floods, droughts) occurred as well as more frequent risks of related damages. The areas affected by aridity extended in Romania in the last decades. The areas most exposed to drought are in the southeast of the country. In the years 2000 and 2007, almost the entire territory of the country was affected by a long time drought. Together with the floods, the long periods of drought cause important economic losses in agriculture, transports and supply of energy, water management, health and households.

➢ Models based predictions show that we may expect a more frequent occurrence of the extreme meteorological events, and the effects will influence:

-**Agriculture**:

In the last decade, the periods of drought and floods became more frequent, with negative effects on the agricultural productivity, especially for wheat and maize. The researchers of INMG used several models to analyze the potential effects on the agricultural productivity of the main culture from Romania. The analyses show various results for various cultures and various rotations of the cultures and applied technologies.

- Forestry:

Almost a quarter of the area of Romania is covered by woods that shelter a great number of species and ecosystems. Modeling of the impact of the climate change on the Romanian woods was carried out by means of several models. In the low and hilly wooded areas, a considerable decrease of wood productivity is foreseen after 2040 because of the rise of temperatures and diminishing of precipitations.

- Water management:

The hydrological consequences of the increase of CO_2 level are significant. Models were made for Romania, with an accent on the main hydrographic basins. The results show the probable effects of the modifications in precipitations and evaporation.

- Human settlements:

The industrial, commercial, residential and infrastructure sectors (energy and water supplies, transports and waste management) are, each of them, vulnerable to the climate change in various ways. These sectors are either directly affected by the modification of temperatures and precipitations or indirectly, by the general impact on the environment, natural resources and agricultural production. The most vulnerable sectors to the climate change are the buildings, the transports, the oil and gas working, the tourism and the industries located in the seaside areas. Other potentially affected industries are the food industry, wood processing, the textile industry, the biomass and renewable energy production.

5. Education, Training, Public Awareness

➢ Article 6 of UNFCCC directly refers to education, training, public awareness, access to information and international cooperation.

➢ The Romanian public institutions, the private sector and the non-government organizations (ONG) participate in activities related to climate change and carry on, in this field, a series of campaigns

of informing and rendering the public aware.

- As far as *education* is concerned, the objective is the development of a plan of action on the education, training and getting the public aware with regard to aspects related to climate change, preparation of some specific training programs dealing with climate change in schools and universities, as well as the preparation of some training and informing materials.
- With regard to the *scientific research and development*, the objective is determining of "the best practices", namely the development of approaches and methodologies of assessing the impact of the policies and measures related to the climate change; the improving of the prognosis methodologies and of the emission evolution tendency, the improving of the GHG emission inventory methodologies and the improvement of impact assessing, of the adapting possibilities included.
- An important objective is also that of introducing campaigns of *rendering the public aware* of the climate change for the relevant involved factors such as the government, the business community, the environment ONGs and the media. These may include from informing activities of a general character to thematic informing campaigns, e.g. the participation of industries in activities related to the joint implementation or/and emission transfer in the UE states. This will also lead to the increase of the level of participation of the public in the development of policies in the field of climate change.

6. Conclusions

- The accurate assessing of GHG emissions in Romania represents an essential requirement for the development of the national policy of Romania with regard to climate change. Consequently, Romania will implement a national GHG assessing system in perfect accordance with the UNFCCC and EU requirements.

- Romania acknowledges the advantages for environment and economy of the benevolent participation in the flexible mechanisms determined by the Kyoto Protocol. Consequently, the country has successfully got involved, for several years, in the Joint Implementation (JI) according to the Kyoto Protocol.

- Romania also intends that, in the near future, to get involved in the international transfer of emissions according to Article 17 of the Kyoto Protocol.

- Romania acknowledges that a long-term effort is necessary and investments in the development of knowledge, capacity and experience for taking of correct decisions, in full knowledge of the case, with regard to the future actions. This future effort will have to be especially addressed to some target fields in education, research and development and getting the public aware, by involving relevant factors: the communities, the private sector and the ONGs.