

## CLIMATE CHANGES – ESSENTIAL CHALLENGE FOR THE ECONOMY OF KNOWLEDGE

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*ABSTRACT: The European Union proposed a new model of economy, at this beginning of century and millennium: the economy of knowledge, simultaneous with the emergence of a new existential reality for us people, after Christ was born; this new, existential reality are the climatic changes. In spite of the warning signals drawn by specialists, the more profound “conquests” of science, only a new educational model can save the humankind of a galloping fall in promiscuity but also in eternity.*

*Key words: economy of knowledge, educational model, cohesion policy, changes*

*JEL codes: F15, F36, F39*

### **Introduction**

The disappearance or the ascension of many dynasties that ruled China could be directly related to the summer, monsoon rains, suggests the researches made by the specialists from the University Lanzhou from China. The scientists established that the long, dry periods are one of the factors that contributed to the decline of the Tang dynasty at the end of the ninth century. The discoveries are based, among other things, on the information provided by the layers of a 1.800 years old stalagmite from the Wangxiang cave. The stalagmite, appeared as the result of the carbonate of calcium accumulation on the cave's ceiling, contains traces of uranium and thorium that allow the chemical dating of the rain periods and their intensity. The differences, regarding the form or the isotopes of the stalagmite's oxygen composition, showed variations in the precipitations that felled near the cave. Thus, the decline of some imperial dynasties such as Tang, Yuan or Ming coincided with mild rains during the summer. Instead, one of China's golden age dynasties, Song, coincided with the period of a powerful summer monsoon. The scientists claim that the arid period between 850 and 940 d.Hr. would also be related to the disappearance of the Maya dynasty from South America. The stalagmites, these natural “archives”, show that the climatic changes can have negative effects on the local people, even if at world's level are gentle. The scientists also claim that the solar activity played a role in the modification of the weather conditions. Still, the green house effect and the aerosols resulted from the human activities in the last fifteen years are responsible for the climatic changes.

### **Types of climate changes**

In the past years, humankind witnessed some unusual weather events. The recording of the temperatures began in 1880 and the months January and April of the year 2007 marked the highest temperatures. The World Organization of Meteorology states: “From January 2007 we record

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extreme manifestations of the climate record temperatures in many regions of the world” and notes that the global temperature in January was 1.89 degrees Celsius higher than the month’s average and in April with 1.37 degrees Celsius over it. In 2007, an evaluation of the Intergovernmental Group ONU for the Climatic Changes showed that the warming of the climate is not equally distributed and this is most probably the result of the human activities mainly the burn of the fossil fuels. According to WOM, these were the most recent extreme phenomenon recorded in 2007 and 2009:

- Depression monsoons, double in number as normal, which produced devastating floods in India, Pakistan and Bangladesh, killing thousands people, determining millions of people to leave their homes and destroying vast areas of lands.
- The first cyclone recorded in the Arabic Sea that hit Oman and Iran.
- The most wet period May-July 2007, in Great Britain (England and Wales), when were recorded the most abundant precipitations (406 mm on square mile) since their first record in 1766.
- The powerful storms that fall in Northern Europe.
- The extremely abundant and untimely rains recorded in some countries in Africa.
- Earth flows, 3-4 meters higher that engulfed 68 islands in the Maldives Archipelago in May 2007.
- In 2007 and 2009 the waves of heat hit the west and center of Russia and the southeast of Europe

If the above examples reflect the situation in the northern hemisphere of the Earth, in the south hemisphere the situation is the same. An unusually cold current, which produced strong winds, blizzards and massive snowfalls in South America, also determined the dropping of temperatures in July 2007, up to minus 22 degrees Celsius in Argentina or minus 18 in Chile. In June 2007, the first snow since 1981 fell in South Africa, the snow height being in some parts of the country up to 25 centimeters. However, in the northern hemisphere, the European winter recorded the warmest January month from history. Holland reported the highest temperatures recorded since 1706 until now, the average being 7.1 degrees Celsius (outrunning with 2.8 degrees the averages of the period 1961-1990). In Germany, during 2007, the temperature raised with 4.6 degree Celsius over the average of the period 1961-1990. Hurricanes that bare the name of some superb human beings – women and men systematically hit the Atlantic shores of the United States and this phenomenon became visible on the shores of the Pacific Ocean. The south east of Europe is scourged by waves of heat without precedent, while Great Britain and Germany confront with major floods, unseen in the last half of century. “It can be said that due to the global warmth a series of extreme weather phenomenon will take place, but we cannot attribute to the global warmth specific events,” says Malcom Haylock, expert in weather conditions. However, in what regards the floods and the draughts it is hard to attribute to human activities the precipitations trend.

The European Commissioner for the Environment, Stavros Dimas, specified that the countries from the European Union must have a common strategy to ensure their future water supplies for the consume of population and for commercial activities. “We must expect that the draught will accentuate due to weather changes,” he added. The Commission’s data show that the draught will affect, in the following years, not only the south of Europe but also the center and the east of the continent. European experts draw our attention on the water’s consume that must be drastically saved, both by menial consumers and by the industrials ones. If not, the draught will endanger the entire continent. Moreover, they recommend that before any economic activity began, the sources of water from that area should be correctly evaluated.

The European authorities underlined that 20 percent of the water used today in Europe is wasted, and the European Commission’s data shows that, soon, the percentage would rise to 40. That is why a rationalization of this consume is necessary. The European Commission specialists’ say, that in the last 30 years, the draught would be worst in the UE member states. In the last 3

years, the dog days and the draught drained the communitarian budget of over 100 milliard euros. In 2003, over 100 billion persons were the victims of the higher temperatures and draught. The draught affected one third of the UE territory and the losses are impressive. The European Commission presented a first series of strategic options adopted at European, national and local level and considered important for the safekeeping of the water resources. One of these strategic options is to establish a correct price for water and the rule “the contaminator pays” to be imposed. This is in fact an older obligation of the UE member states that must renounce at the free use of water until 2015. Important modifications are necessary for the distribution of water at users and the way in which it is used. The Commission proposes, among others, the following measures: the installment of economic water devices at the faucet and new systems for the showerhead and toilets. At a larger scale, the Commission recommends a proper assessment of water between the economic sectors, according priority to water economy.

According to the latest ONU rapport, from February 2007, Earth is subjected for some time to a phenomenon of global warming as the result of the carbon dioxide emissions. The climatic changes will continue for decades even if, theoretically, the emissions of carbon dioxide would be largely stopped. The global warming is a phenomenon certified by the World’s Organization for Meteorology, the official system of the United Nations, regarding the climate. According to the studies conducted under the aegis WOM, between 1960 and 1990, the global rise of temperature on Earth was of almost half degree. Many areas from Europe and US confronted with waves of heat and with record temperatures in the months July and August in the recent years.

In numerous regions of the United States, the temperatures raised over 40 degrees Celsius, while the average of the European temperature from July exceeded with 2.7 degrees Celsius the world’s climatic norm. According to Baddour Omar, doctor in climatology at WOM from Geneva (Switzerland), the global, climatic sceneries indicate that we will witness more accentuated warmth, with more than 3 degrees in the north of Romania and over 4 degrees in the south. The specialists are almost unanimous in their recognition of the fact that people provoke most of the climate changes. The manager Greenpeace Romania, Ana-Maria Bogdan, warn us that “if the emissions of dioxide of carbon are not reduced with 20 percents until 2020, we risk that the temperature of Earth to exceed with almost 2 degrees the current temperature and the climatic changes will be unprecedented in the history of mankind.” One of these consequences would definitely be the rise of the oceans and seas level. Romania is directly affected and the phenomenon of the beeches erosion – already present on the Black Sea littoral will accentuate in the future.

Another aspect of this problem is the damage of the agrarian areas. The land is scourged by hotter and hotter summers. According to a study conducted by experts in climatic changes from 13 countries, including Romania, a large part of Europe will become desert. Our country is not an exception. The territories which will be most affected will be Dobrogea, Oltenia, a part from Muntenia and Banat. This fact will start a chain reaction: the agrarian production might reduce with 50-60 percents. The prices for the agrarian productions will rise, and those who will suffer more will be the peasants who dependent on the field’s crops.

According to Jim Hansen, climatologist at NASA, the global warming is not faced seasonably today by the simple reduction of carbon emissions – which registered in 2005 the highest levels recorded on Earth. These emissions of carbon have as result the raise of the seas levels and the disappearance of many species of animals that do not succeed to adapt to the changes of their delicate, climatic habitat. As a WWF (World Wildlife Fund) report says, if the global warming will raise with 2 degrees the pre industrial levels the rate of these species disappearance would be of 38 percent in Europe and 72 percent in north-west Australia.

Starting with 1970, which marks the entering of the humankind in the post-industrial era, the levels of carbon dioxide emissions, raised with almost 80 percent. The effects, less sensed at the beginning, and even less believed by the politicians, are reflected in the annual, medium

temperature rise on Earth. The specialists began to make calculus and prognoses more and more pessimistic for the planet: to maintain the global temperature at +2 degrees is necessary a continuous reduction of the gases with green house effect of at least 50% under the existing level in 1990 and this until 2050.

Nineteen eighty-six is the year in which the concept of durable development is defined: “the satisfaction of the present necessities without mortgaging the capacity of the future generations to satisfy their own necessities.” This concept deals with the interest to develop new sources of energy and to reduce the waste that affects the environment. The fossil fuels are a finite and economically limited resource, inducing emissions that affect the environment and contribute to the climate change. A durable, energetic system must integrate regenerating sources of energy and burning chains with limited emissions, accessible as cost. The durable development necessitates the generation of the equilibrium between the economic development and social and environment equity, in all planets’ regions. This concept cannot be applied without a real political will of a growing number of countries.

In 1987, the Protocol from Montreal, signed then by many industrialized states of the world stipulated the gradual diminution of the chlorofluorocarbon emissions by introducing new technologies that did not used these noxious gases for the ozone layer. In addition, the results appeared fast enough.

### **Measures for the limitation of climate changes**

From 1997, the climatic protection is associated with the name of the Nippon city Kyoto, where the United Nation adopted the first accord that obliged the signing states to protect the climate. Nevertheless, the Protocol did not obliged at anything – from legal point of view – the medium developed states such as India and China. When it was negotiated, it was argued that the industrialized, occidental states have the moral obligation of “cleaning first in their own yard and throwing the dirt they produced for many centuries”, before other countries joined them to save the blue planet.

Initially, only the less industrialized states engaged to reduce the emission of gases that provoke the so called green house effect. The year 2000 was considered as moment of reference. UE assumed the duty to reduce up to 8 %, until 2012, the emission of toxic gases. Japan and Canada promised a decrease of 6 percents while the US initially promised a decrease of 7 percents. The American Congress, later on rejected the Treaty’s Protocol initially signed by Bill Clinton.

Today, 175 countries ratified the Protocol of Kyoto, which remains valid until 2012. In December 2007, new negotiations of prolonging the effects of the protocol started, in the Indonesian island Bali, negotiations that concentrate on the period following 2012 and were based on the pledges taken as result of the Kyoto Protocol.

The ambitious Protocol of Kyoto, that was believed to slow down the process of global warming, became valid, the great majority of the industrialized countries agreeing to reduce the polluting emissions, except the United States of America. According to the terms of the Treaty, the industrialized world agrees to reduce with 5 percents the actual level of gases emissions until 2012, based on some individually established cotes. The UE promised to reduce the polluting emissions with 8 percent; the reducing refers to three important gases: carbon dioxide, methane and oxides of azoth that will be measured comparatively with 1990 (with the exception of some countries with economy in transition, among which Romania, which are compared with 1989).

In 2005, when the Treaty was signed by 141 countries, among which 30 industrialized, United States and Australia considered that the protocol would affect too much their economies. In addition, President George Bush publicly expressed his doubt about the global warming researches, but only a few scientists contest the idea that the Earth warms. At the end of 2007, the United States admitted the necessity of some measures to stop the global warming, and the new Australian govern

announced important modifications in the chapter about the protection of the environment, ratifying the Protocol of Kyoto on the 6<sup>th</sup> of December 2007.

The major opinion is that the emissions in the atmosphere of the three gases mentioned above, and three types of flours, contribute to the installment and sustaining of the green house effect that can have a dramatic consequences on the delicate climatic system of the planet. The global, medium temperature rose with 0.6 degrees Celsius during the period 1900-1990, the prediction being that until 2100 it will rise with 5.8 degrees depending on the quantity of carbon dioxide in the atmosphere. Referring to this, the European commissioner for the surrounding environment, Stavros Dima, said: "The climatic changes constitute one of the most important challenges from the sphere of the surrounding environment and are a threat for the economy of the EU states economy. Our purpose of bringing together the ones involved in this field is that of discussing the solutions and the efforts that must be done to reduce the green house effect."

When the United States renounced to the Treaty of Kyoto the European, industrial leaders became concerned about the economic costs of the plans to defend the environment in UE. The Intergovernmental Comity for the Climatic Changes, founded in 1988, by the World Meteorological Organization and by the Program of the United Nations for Environment, made several reports to evaluate the climatic changes. The conclusions are the following: the global, medium temperature rose with 0.6 degrees Celsius (during 1960-2000), being more rose in North America, the Equatorial zone and in Asia. The level of the sea, as a global media, rose annually with a millimeter. A diminution in depth and spatial expansion of the ice in the artice zone (with 40 percent in the last 30 years) took place. In exchange, there were no changes in the expansion of the ice in the Antarctic zone. The glaciers retreated from the Alps. Mutations in the bio systems took place: the early blooming of the plants; the migratory birds arrived early; the precipitations rose with 5-10 percent at the medium and higher altitudes from the northern hemisphere and dropped with 3 percent to the subtropical regions.

The climatic sceneries are conceived with the help of some complex, numerical models that are based on chemical, dynamic and physics laws. Some important factors are taken into consideration when we talk about climatic sceneries like the green house effect, the socio-economic development and the technological changes. Here are some climatic sceneries foreseen by the specialists for the XXI century. The global, medium temperature will rise with 1.4-5.8 degrees Celsius that will represent a worming twice or tenth time bigger than the one from the last century. The quantities of precipitation, at global level, will rise with important regional differences: droppings or risings between 5 and 20 percent. The changing of the climate will lead to modifications in the atmospheric circulation. This, at its turn, will generate changes in the frequency and the multitude of some extreme events (tornados, hurricanes, tsunami etc.). The number of the warm days will rise and the number of the cold days will diminish. The amplitude and the frequency of some extreme precipitations and draughts will rise.

On March 11, 2005, the European Commission presented its document with strategies post-2012. In this document, entitled "The winning of the fight against the global changes of the weather", the Commission did not established new targets, but concentrated on the challenge of bringing together as many countries as possible (among which US and Australia, but also countries like China, Brazil or India). It also stipulated the inclusion of more sectors with activities to be followed (for example aviation and maritime transports). The UE ministers of the environment made more ambitious proposals to reduce the green house effect, than it was the one for the Protocol of Kyoto: with 15-30 percent until 2020 and with 60-80 percent until 2050. The European ministers wanted to clarify the necessity of a global approach that included the cooperation with industrialized countries, which chose to adhere to the Kyoto Protocol, as well as with new economic powers like China and India.

Comparatively with the reference period 1961-1990, the statistics underline that in the period 2002-2005 was registered a higher annual medium temperature with 1.6 degrees Celsius. The months February, March, May, June, July and November were hotter than usual. Annually, in one country or another, on each continent, some storms with different intensities and with whirlwinds take place. Romania is not an exception of this rule. In the last 50 years, as the result of the global warmth, the extension of the marine ices in the northern atmosphere was lowered with 40 percent. The annual period of the rivers and lakes frost was reduced with two weeks in the last century, recently ended.

As some American researchers state, the whole in the ozone layer over Antarctica ended its process of enlargement. In addition, in the next 60 years, the ozone layer could return to normal. The ozone layer blocks the Sun's ultraviolet radiations that are the main source, among other, for the apparition of the skin cancer. The recovery of the ozone layer seems to be the merit of the reduction of the green house gases emissions, as Freon. The ozone layer protects life on Earth of the ultraviolet radiation that came from Cosmos, especially from the sun. Discovered more that 50 years ago the whole in the ozone layer over Antarctica extended rapidly. The cause – the colure ions from the gases with chlorofluorocarbon decomposed the ozone or the ion oxigen<sup>3</sup>. Chlorofluorocarbon is used since the 1930s in the manufacture of different electric objects as the refrigerators and the air conditioner devices. After 1987, when the Protocol from Montreal was signed, regarding the diminish and later the forbidding of chlorofluorocarbon, it was observed a slowing down in the rhythm of degradation of the wholes from the ozone layers and then even a tendency of recovery. The recent studies that followed the evolution of the whole in the ozone layer over Antarctica, estimate a total recovery of this layer around 2050.

### **Proposals for the limitation of the climate changes**

Romania was among the first countries that ratified the protocol from Kyoto to reduce the greenhouse gases, since 1997, with the Law 3/2001. Once applied this protocol, Romania can sell to other countries involved the right to emit green house gases within the limit of the cote allocated to our country. Romania has a cote of 250 billion tones of gases equivalent carbon dioxide compared with 147 billion tones that pollute the atmosphere annually. The difference of 103 billion tones equivalent carbon dioxide can be over a milliard euro that is the sum necessary to start the restructuring of the energetic system. The selling of this difference will have to take into consideration the development on medium and longer term of the Romanian economy. For the emissions sold now with less then 10 euros per tone, the Romanian companies could pay in the future over 100 euro penalties. As a result, the benefice to obtain in these years a considerable sum from the selling of gases emissions could cost us dearly in the future.

At the end of 2007, took place, under the umbrella of UN, an international meeting on climatic problems, hosted as we said before in Bali (Indonesia). The meeting had as first goal the official beginning of the discussions regarding the formation of an international frame for the climatic protection after the provisions of the Kyoto Protocol stopped. In the same time a plan of the International Climatic Convention will be created that will contain the objectives, the agenda of the activities and aspects as the role of the developing countries in the fight against the climatic change or technology development. The new treaty will be debated in 2009. "From the experience of the past years we knew that the debates on themes so difficult cannot be named negotiations. I hope that here on the Bali island we succeed to establish a formal plan of negotiations. I am convinced that the delegations will face the challenges described by the scientists. Our mission is extremely important" declared at the beginning of the Conference from Bali, Yvo de Boer, the general secretary of the Frame Convention of UN on climate changes.

A report made in 2006 by CEE Bankwatch Network and by the Earth Friends-Europe show how much money UE gives for the fight against the effects of the climate change. According to

these two organizations, the finances, as they were established for the period 2007-2013 will not be efficient for the fulfillment of the European common goals. According to this report, the member states should accord five percent from the total of the European funds to prevent hazards, and each communitarian state should have appropriate values for the gases emission.

The problem of the global warming, one of the most important preoccupations of the planet specialists was analyzed in January 2007 at Davos, Switzerland at the traditional World Economic Forum. There, over 500 scientists from the entire world reunited to give a diagnosis to the “climatic bomb”: the global warming. The group of intergovernmental experts empowered by UN, who deal with the global warming problem, published a new report on the theme of our planet future and the danger of global warming. The melting of the glaciers and the dilatation of the oceans are also consequences of the warmth that might “through retroaction” to play a role of accelerators of this process. “The climatologists sustain that the greenhouse effect might amplify the warmth without clearly determine the limits of this phenomenon and without being possible to overpass it” explained Edouard Bard, from College de France. This study regarding the effects of the climatic changes is axed on the modifications already appeared in comparison with the 80s and makes foresights for the next 90 years, until the end of this century. In some zones of the planet, the earth will become barren, and the cereal cultures will be successfully planted only in the north of Europe, not in the south or center as today. In Europe, in 20 years, the production of corn will be of 60 percent from the present one, and the territories suitable for the cereal crops will be only Poland and Germany. According to the study made by UN specialists the warming of the weather will affect the entire European continent, but the territories with higher risk of becoming deserts are the ones from the southern half of the continent. Romania is also found on the list of the territories where the changes will be accentuated. Together with Spain, Italy and Greece, our country is among the first affected by the changing of the weather, the manifestations will be visible during the period 2015-2025. In Romania, the main parts affected by this process will be Oltenia, Banat and Dobrogea where land will dry because of the lack of water.

“The global change of the climate can act as a multiplier factor for the instability of the most troubled regions of the world and constitute a significant challenge for the national security of the US”, stated a report publicized in April 2007, by the nongovernmental American organization CAN Corporation. The special value of the somber prognosis included in the report is sustained by the fact that a Military Consultative Comity approved the text. This Comity was constituted from 11 generals and admirals in retreat, among whom Gordon R. Sullivan, ex chief of the General Staff of US Army, vice admiral Paul G. Gaffney II, ex president of the National University of Defense and ex chief of the research programs of US Navy, as well as the admiral Joseph W. Prueher, ex chief-commander of the American forces from Pacific and ex ambassador of US in China.

In September 2007, the European Commission proposed a specific alliance at world level, in what regards the fight against the climatic changes. The objective is to encourage the measures of adaptation, the reduction of the emissions resulted from the uncontrolled cutting of the woods, the use of the benefices resulted from the world’s market of carbon and the backing of the less developed countries to be prepared to face natural catastrophes.

Between 2007 and 2013, the UE will invest 177 billiard of euro in 10 east and central European countries, members of the Union. The money are part of the structural and cohesion funds. “In the same period in which these money will be spend, Europe will have to take serious measures to reduce the gases emissions until the recently established of reduction will be 20-30 percent in 2020 and 60-80 percent until 2050”, is shown in the report. The two organizations consider worrying the fact that the four countries that received the biggest allocations of European funds – Spain, Portugal, Greece and Ireland – were also the witnesses of the greatest rise of carbon dioxide emissions. “If EU wants to fight against the climatic changes efficiently, it must be certain that in the east and the center of Europe will not take place the same thing. On the contrary, the

European funds for the new member states must contribute to the exactly opposite: the reduction of the gases emissions and the improvement of the life's qualities", shows the document.

Both the World Organization for Meteorology and the World Organization for Health recognize the fact that the weaves of heat affect the health and, that is why, they are in an advanced stage of anvil a Guide of fast alert in the case of the heat waves. Today, the WOM collaborates with a series of partners to create a multi-system of warning meant to reduce the effects of the climatic change, especially by the strong storms, floods and waves of heat.

With the occasion of the Worlds Health Day – annually celebrated on 7<sup>th</sup> of April – the World Health Organization underlined the serious effects that the global warming has on peoples lives. The general manager of WHO warned that the tornados, floods, storms and draught kill thousands of people each year. In addition, diseases related to climate – as malaria, diarrhea, malnutrition caused by the lack of proteins, lead to more that three billions of human lives each year. "It is necessary that the governments, the health departments in each country to adopt strategies which put in first place the health and the welfare of the people and to protect the population of the effects of the climate change", underlined the WOS manager. The climatic changes will contribute to the enhance of blindness caused by cataract cases due to some abnormal levels of exposure to ultraviolet razes, shows a study conducted in April 2008 by the Australian researchers.

The aviation, energy, financial services, transports and tourism departments were included in a rapport referring to the risks of climatic changes, elaborated at the beginning of April 2008 by the consultancy and financial audit firm KPMG. The climatic changes specially threaten the six cited departments that are less or not at all prepared to face these changes. All the 18 departments analyzed by KPMG in the report are not sufficiently prepared to confront with the new risks associated to the climatic changes. "We analyzed industries from the entire global economy and we observed that there are major differences between them in what regards the relation between the climatic changes risks and the degree of training to face them, existing a tendency to underestimate them", showed Barend van Berger, manager of KPMG Sustainability, the division that made the report. The conclusions of the document, entitled "Climatic changes will change the business" is based on the analysis of 50 partial, public, reports regarding the risks on business and the economic impact of climatic changes at department level. The public cited rapports were analyzed and for each department was evaluated a level of risk and a degree of training to face this risk. Although the energetic department is better prepared than the other departments analyzed, the climatic change with which the humankind confronts for years transforms it in the most risky department analyzed.

## **Conclusions**

A climatic system called the North-Atlantic Oscillation influences the European climate. This system bases on the measurement of the atmospheric pressure at sea level found near Island and Azores Islands. In the last 50 years, these numbers had the tendency to drop but it is hard to say that this was a consequence of the human activity as long as it is not precisely established. "We have the definite proof that man has an immense influence on the way precipitations form. We must fight against the effects of the climate change and, especially, to improve the protection systems against floods", says Nathan Gillet, professor at the Department of Climate Research from the University East Anglia. The predictions of the British Environmental Agency are somber: The Great Britain will suffer annual damages of 2 billiards dollars, exclusively due to the floods provoked by the climatic changes. The Globe and Mail publication has a more powerful point of view, based mainly on a study done by the prestigious magazine Nature.

We must expect that, in the following years, Canada, Russia and Northern Europe to confront with powerful precipitations, while the territories found at north of Ecuador to become more arid. A clear connection was identified between the way in which the influence of man on

nature and the distribution of the precipitation: “It is for the first time when we detected a correlation between the precipitations and the man’s influence on the environment. We can manage with the changes of temperature but with the ones that intervene in the distribution of water, we are not. It will be an impact on the world economies and on the way we produce food”, says Francis Zwiers, one of the authors of the report.

A British study underlined the fact that the global warming, with all its series of extreme phenomenon, tempered in the last two years by a series of natural phenomenon, will sense much serious at the beginning of 2009, the following years being extremely warm. According to the study made by a group of researchers from the British National Agency of Meteorology, in at least half of the years from the period 2009-2015, the annual, medium temperature will be greater than the one in 1998, the year used as point of reference. The predictions generated by a computer program specially conceived by the British weathermen, program which calculates both the elements such as green house gases emissions and the temperatures and maritime and oceanic currents or weather phenomenon such as “El Nino”, that announces the formation of hurricanes in the Atlantic Ocean and monsoon storms more powerful than usual in Asia.

Starting from this data, the researchers realized a climatic simulation for the period 2005-2014 and the conclusion was that a part of the Atlantic Ocean would cool and the resistance to warm of the Arctic Ocean compensates with the rise of the temperatures provoked by the green house gases. This compensating effect will be impermanent and after 2009, the global warming will be much more evident. The whole of the analyzed decade will register a raise of the annual, medium temperatures. In this way, in the British researchers’ opinion, the annual, medium temperature in 2014 will be with 0.3 degrees Celsius higher than the one in 2004. The previous studies stipulated a rise of the annual, medium temperature with 3 degrees C until 2100, warning that it will have catastrophic influences on the surrounding environment. To verify the viability of the program, Doug Smith, from the British National Agency of Meteorology and his colleagues tested the new model of stimulation on the period 1982-2001, to confront the results with the reality registered by the weather stations in the world. According to Doug Smith, the validity of the new model worked, because it gave more precise results of the temperatures than the precedent electronic simulations.

Following the current direction, China will outdo the US, as green house gases emissions, but it does not reduce them, as long as the US does not do the same. We expect a country as China to commit at the reducing of emissions, but UE can manifest its will to cooperate with the less developed countries to enhance their contribution at the local effort to reduce the emissions by using all the opportunities to reduce the intensity of the emissions because of their economic development. It is a good thing that the impressive economic growth from China, India, Vietnam or other countries, to be a great responsibility for the world, considering that it implies a greater responsibility of these countries taking into consideration the fight against the global provocations as the climatic changes.

## References

1. Ciupagea, Constantin și Câmpeanu, Virginia, coordonatori, *Energia în cursa competitivitate – încălzire globală*, Editura Expert, București, 2007
2. Comisia Europeană, *Planul de acțiune privind eficiența energetică 2007 – 2009*, Bruxelles, 10 ianuarie 2007
3. Conecini, Ion și Dumbravă, Virgil, *Bursa de energie electrică: între deziderat și necesitate*, București, Editura AGIR, 2007
4. Diga, Silvia-Maria, *Production, transport, distribution et utilisation de l’énergie électrique*, Craiova, Editura Sitech, 2004

5. \* \* \*, *Doing More with Less - Green Paper on Energy Efficiency*, European Communities, Bruxelles, 2005
6. \* \* \*, *Energy in a Finite World-Paths to a Sustainable Future*, report by the Energy Systems Program Group of the International Institute for Applied Systems Analysis, USA, 1981
7. \* \* \*, *Energy Efficiency Policies*, World Energy Council Report, United Kingdom, 1995
8. Fara, Vladimir și Grigorescu, Radu, *Conversia energiei solare în energie termică: principii și aplicații*, București, Editura Științifică și Enciclopedică, 1982
9. \* \* \*, *Foaie de parcurs pentru energia regenerabilă: crearea condițiilor pentru o pondere de 20 la sută a energiei regenerabile în cadrul sectorului energetic al UE în 2020*, MEMO/07/13, Bruxelles, 10 ianuarie 2007
10. Gâf-Deac, Ioan I., *Noile orizonturi juridice și globalizarea*, Editura Infomin, Deva, 2002
11. Gore, Al, *Pământul în cumpănă*, București, Editura Tehnică, 1995
12. Heinberg, Richard, *The party is over: Oil, War and the fate of Industrial Societies*, New Society Publishers, 2003
13. Manea, Dumitru, *Șanse ale surselor noi de energie în competiție cu combustibilii clasici*, Institutul Național de Informare și Documentare, București, 1991
14. Mashburn, William H., *Managing Energy Resources in Times of Dynamic Change*, USA, 1989
15. Popper, Laurențiu; Mihăescu, Lucian și Iliescu, Maria, *Eficiența economică a sistemelor de energie*, București, Editura Perfect, 2005
16. \* \* \*, *Progress Report on the Implementation of the European Renewable Directive*, WWF, 2004
17. Rugină, Vasile, *Echipamente moderne de valorificare a surselor regenerabile de energie*, București, Institutul Național de Informare și Documentare, 1991
18. \* \* \*, *Support for Implementing the Energy Efficiency Protocol of the Energy Charter Treaty*, proiect elaborat de ERM Energy din Marea Britanie pentru Ministerul Industriei și Comerțului din România, octombrie 1999
19. Țicovschi, V., *Globalizare și transfer de tehnologie*, București, Editura Enciclopedică, 2006
20. Vasile, N., *Energia - probleme actuale, raport de veghe tehnologică*, București, Editura Electra, 2007
21. Wilson C., *Energy: Global Prospects 1985-2000. Report of the Workshop on Alternative Energy Strategies (WAES)*, McGraw-Hill Book Company, New York, 2001