Projections of impacts in **THE CZECH REPUBLIC**

Climate change does not affect only temperature fluctuation. The climate influences many natural components, including human beings. Regarding the Czech Republic, with a high level of probability, global warming will threaten water management most severely.








Precipitation pattern changes might contribute to higher risk of floods occurrence, or conversely, long lasting dry periods. As a result of lower river flow during dry seasons, rivers' water quality will be worsen, because concentration of pollutants in wastewater emitted into these rivers will not change.

The prolonged vegetation period of agricultural crops from 20 up to 50 days might delight farmers. However, with frequent occurrences of delayed-freeze and a variation of extremely high temperatures, storm rainfalls or several-weeks long dry seasons, the projection nonetheless does not bode well.

Spruce woods, which are dominant in the Czech Republic, are simultaneously very sensitive to frequent changes between warm and cold periods, dry and wet seasons, as well as a polluted environment. There are also other endangered ecosystems, in particular those above the forest boundary. Due to temperature increases, these ecosystems will have to shift to the upper altitudes. Pests and the spread of introduced plant and animal species will pose a significant problem.

Climate change will cause a greater occurrence of infectious diseases, and possibly new exotic diseases. Extremely high summer temperatures and air pollution are health hazards for many people. The number of people suffering from allergies will undoubtedly increase.

source: http://www.mzp.cz

Is there a **SOLUTION?**

There are two different, but interconnected ways to address climate change: mitigation and adaptation.

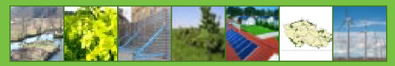
MITIGATION
reduction of greenhouse gas emissions

We can reduce emissions by saving energy, mainly by increasing the energy efficiency of devices, the insulation of buildings, the insulation of heat distribution, and the combined production of heat and electricity (cogeneration).

A very important tool used to reduce greenhouse gas emissions is the production of heat and electricity from ecological sources, in particular renewable ones (sun, wind, water, biomass, etc.).

Within the scope of emissions sinks, wood ecosystems play an essential role. It is because they are able to limit the carbon in the atmosphere that it is so important to support the afforestation of unused agricultural areas.

The reduction of nitrogen and methane emissions from agriculture and waste management must be effected by the limited use of fertilisers and inhibition of black waste dumps.



ADAPTATION
adapting to climate change impacts

With regard to enhance the landscape water retention, it is necessary to focus on revitalization of rivers and their surroundings, what among others will contribute to flood risk reduction during storm rainfall. In this respect, flood prevention and protection is inevitable.

In order to prevent the losses of water and soil in agriculture, many more agro environmental and anti-erosion measures must be implemented.

In order to protect our forests, their species composition has to be modified. Mixed forests are much more resistant than monocultures. To avoid the reduction of biodiversity and to protect nature, protected areas and the system of NATURA 2000 were established.

Regarding extremely high temperatures and tick occurrence, medical staff must arrange early warnings for the population and monitor high-risk sectors of the population (children, older people, etc.).

source: http://www.mzp.cz

Czech Republic **ACTION**

The Czech Republic is well aware of the importance of climate change issues. Mitigation and adaptation measures are being implemented into our system of law on the basis of various political decisions.

The main Czech strategic document is the National Programme to Abate the Impacts of Climate Change in the Czech Republic, which was released in 2004. In 2007, the National Program was evaluated and the government decided to replace it and prepare a new Climate Protection Policy in the Czech Republic. This new strategy will be released in the end of the year 2009 and will contain mitigation measures. The Climate Protection Policy determines the strategy of the Czech Republic for climate protection until 2020. This document specifies main as well as partial targets for emission reduction and defines substantial mitigation measures with significant potential of greenhouse gas emission reduction. The adaptation issue is addressed in the document only in general terms but it is expected that it will be elaborated further.

New adaptation strategy is still under preparation due to uncertainty of climate change impacts and complexity of the adaptation issue. It will focus on water management, agriculture, forestry, biodiversity, tourism, energy sector and also urban areas.

Emission reduction progress in the Czech Republic:

✓ in the context of the Kyoto protocol we made an obligation of an 8 % emission reduction by 2012 relative to 1990 levels,

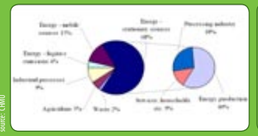
✓ already in 1991, the total emissions dropped by more than 10 % mainly due to the economic restructuring of the Czech Republic,

✓ despite economic growth, greenhouse gas emissions dropped by approximately 25 % during the 1990 – 2006 period,

✗ the indicators of energy efficiency and emissions per capita are less favourable for the Czech Republic,

✗ emissions from transport are still growing rapidly.

Emission reduction progress in the Czech Republic:



source: ČHMÚ

Greenhouse gas emissions:
150 823 000 t CO_{2eq} (2007)

Emissions per capita:
14,5 t CO_{2eq} (2007)

Emissions per GDP:
0,69 kg/1000 USD (2007)

EU and **CLIMATE CHANGE**

The Czech Republic joined the European Union in 2004. The EU has placed a high priority on climate change policies and emission reductions. We could state that the EU is currently a leader in climate change issues and negotiations on the international level.

During the first half of the year 2009, the Czech Republic presided over the Council of the European Union. A significant responsibility came with this task. The Czech Republic chaired and organised Council meetings, negotiated with the European Parliament and Commission and represented all 27 member states on the international level. Within the framework of environmental policies, climate change was a key issue for the Czech Republic.

EU2009.CZ

Main points of the Czech Presidency agenda:

✓ the Czech Republic became a key player in negotiating the climate change regime and emission reduction targets after the end of the first Kyoto protocol commitment period (in 2012). With this regard, Council conclusions on the further development of the EU position on a comprehensive post-2012 climate agreement were adopted in March 2009.

✓ the climate and energy package was released by the European Commission in January 2008 compromising draft legislative proposals intended to help member states in reaching their relative targets. It consists of a proposal for a Directive amending Directive 2003/87/ES on an emission allowance trading system (the inclusion of aviation into the system is being considered), a proposal for a Directive on the geological storage of carbon dioxide, a proposal for a Decision on the effort of member states to reduce their greenhouse gas emissions and a proposal for a Directive on the promotion of the use of energy from renewable sources,

✓ adaptation to climate change, the White Paper, was released by European Commission on 1st April 2009 and proposes several tools to combat climate change adaptation at different levels. It emphasizes the importance of coherent and integrated approach in all relevant sectors, need for solid knowledge base and information sharing and close cooperation at all levels in order to avoid transboundary effects or mal-adaptation. The Council Conclusions on Climate change: Towards a comprehensive EU adaptation strategy adopted in June 2009 contains all key proposals from the White paper.

Everyone CAN HELP

Climate change is a global problem that demands mostly the activities of governments and heads of states that must work to adopt serious political decisions. However, every one of us can help somehow. Even a small change in our behaviour counts and can add to the reduction of greenhouse gas emissions and improve our quality of life.

RECYCLE
you can save the energy needed for creating a new product, as well as the greenhouse gas emissions produced during its manufacturing, distribution, and in its combustion or deposition on waste dump. The recycling of 1 kg of paper prevents emissions of methane and saves 900 g of CO_2 emissions. Use plastic carrier bags more than once.

SAVE ELECTRICITY
turn off the light if you do not need it. Do not leave appliances in standby mode– a TV set still consumes approximately 45 % of its energy in standby mode. Unplug your charger when you are not currently recharging you mobile phone. Otherwise, up to 95 % of its energy is wasted. Use energy saving light bulbs, since their lifetime is longer and they use 5 times less energy than regular bulbs.

CONSERVE WATER
4 times less energy is needed for showering than for taking a bath. Turn off the tap when cleaning your teeth; you can save several litres of clean drinking water.

REDUCE THE CONSUMPTION OF HEAT
by lowering the thermostat by just 1°C you can save 5 to 10 % of energy costs and prevent the production of up to 300 kg CO_2 emissions a year. Ventilate your rooms regularly for short periods. Insulate your house and change your windows for double paned.

USE PUBLIC TRANSPORT, BICYCLE OR WALK
10 % of greenhouse gas emissions in the EU come from private car transport.

source: http://ec.europa.eu/index_cs.htm

Printed on ECO carton manufactured from recycled pulp.

Ministry of the Environment
of the Czech Republic

You can find additional information and links about climate change on the web pages of the **Ministry of the Environment of the Czech Republic** (www.mzp.cz)

Ministry of the Environment
of the Czech Republic

CLIMATE CHANGE

CZECH REPUBLIC

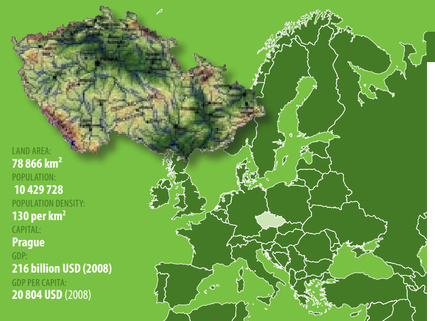
Climate change is a very serious environmental problem that affects all aspects of our present life and will affect it much more in the future. We would like to explain the main principles and impacts of this global issue and the activities and targets of international organisations, the European Union and the Czech Republic, with particular focus on the period of the Czech Presidency of the EU Council.

The Czech Republic was established in 1993 from the former Czechoslovakia. The country went through economic reforms and privatisation, making the transition from central planning to a market economy. The Czech Republic joined the European Union on 1 May 2004.

This landlocked state is situated in Central Europe. The landscape varies from mountains such as Krkonoše or Šumava along the Czech borders to basins in the northwest and southeast of the country. The basins are drained by main rivers such as the Vltava, the Elbe and the Morava River. The Czech climate is moderate and continental, with relatively hot summers and cold winters. Most rains occur during the summer.

Concerning the climate change issue, the Czech Republic acceded to the UNFCCC in 1993 and ratified the Kyoto Protocol in 2001. The country is an Annex B Party to the Kyoto Protocol with an 8% reduction target of greenhouse gas emissions by 2012.

BASIC FACTS ABOUT THE CZECH REPUBLIC



LAND AREA:
78 866 km²
POPULATION:
10 429 728
POPULATION DENSITY:
130 per km²
CAPITAL:
Prague
GDP:
216 billion USD (2008)
GDP PER CAPITA:
20 804 USD (2008)

Climate CHANGE

The Earth's climate system has gone through substantial changes since the origin of the planet. Mild and warm periods were replaced by cold ones several times. Each of these periods last for hundreds of millions of years. According to the scientific evidence, changes in the composition of the atmosphere were particularly responsible for increasing or inhibiting the greenhouse effect. This effect has been influenced by natural climatic factors, such as changes in solar activity, changes in the Earths rotation, extensive volcanic activity etc.

The greenhouse effect is a basic and natural atmospheric process. The average temperature of the Earth would be minus 18°C without this phenomenon.

With population growth and development, human beings started to affect the climate system significantly. With the industrial revolution in the 19th century, we began to exploit our fossil fuel reserves and to burn them for energy production. During the combustion process, huge amounts of greenhouse gasses are emitted into the atmosphere and contribute to the natural greenhouse effect.

The main anthropogenic greenhouse gas is carbon dioxide. Its normal concentration before the industrial revolution was 280 ppm, while its present concentration is approaching 400 ppm (ppm denotes one particle of CO_2 in one million particles of air).

THE GREENHOUSE EFFECT

Global CONCERN

In the second half of the 20th century, scientists became interested in and began to investigate the dilemma of global warming and climate change. In 1988, the World Meteorological Organisation (WMO) in cooperation with the United Nations Environment Programme (UNEP) established the Intergovernmental Panel on Climate Change (IPCC). The objective of the IPCC is to collect and evaluate scientific data related to climate change, to estimate its consequences and to formulate strategies. These scientific data are essential for international negotiations and decisions.

The most important step in international climate protection was the adoption of the United Nations Framework Convention on Climate Change (UNFCCC), which was signed by more than 150 countries in Rio de Janeiro in 1992. Its ultimate objective is to protect earth's climate system for current as well as future generations. This goal must be achieved by the stabilization of greenhouse gas emissions at an acceptable level, which would ensure that climate change impacts would be less significant.

In 1997, at the 3rd session of the Conference of the Parties (COP) of the UNFCCC in Japan, the Kyoto Protocol was adopted (and came into force in 2005). Its basic objective is to reduce the global average of greenhouse gas emissions by 5,2 % relative to 1990 levels by 2012. The developed industrialized countries that have ratified the Protocol also have their specific reduction targets (for example, the former EU-15 has agreed to reduce 8 % of their emissions).

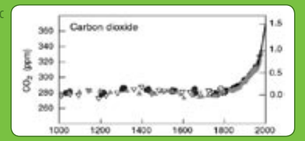
The legal force of the Kyoto Protocol will expire in 2012. Present international negotiations under the UNFCCC concern this issue. In order to achieve an agreement, it is crucial to focus on the basic problem: our climate is changing and we have to protect the whole environmental system, as well as the most vulnerable individuals, to avoid or at least abate the impacts. A new international agreement on climate change should be adopted in December 2009 at the COP 15 in Copenhagen.

Scientific EVIDENCE

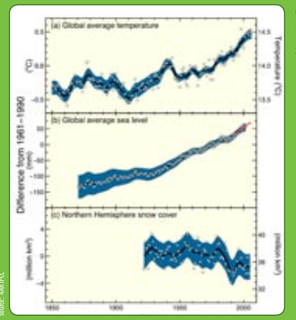
In 2007, the Intergovernmental Panel on Climate Change (IPCC) released its Fourth Assessment Report (4AR).

The outcomes were evaluated and composed observation data from oceans and all continents. According to the results, climate change is already happening in all parts of the world and much faster than ever expected. There is a significant relation between CO_2 concentrations and temperature increase, as shown in the following figures.

Global atmospheric concentrations of carbon dioxide



Changes in temperature, sea level and snow cover

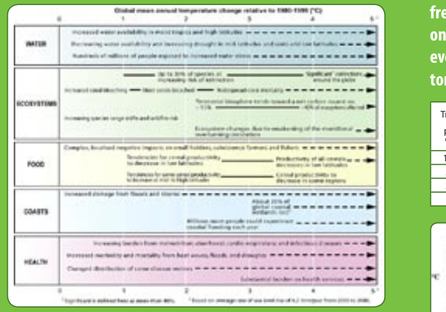


source: 4AR IPCC

Projections of IMPACTS

Different types of landscapes are formed due to interaction of relief, soils, climate, water, fauna, flora and humans. An imperceptible change of one element can cause a chain reaction and significantly affect all other components. According to the results of the IPCC's 4AR, as a result of climate change, a catastrophic scenario now threatens the whole world.

Examples of impacts associated with global temperature change



Notes to the figure: the black lines link impacts; broken-line arrows indicate impacts continuing with increasing temperature.

Climate change is becoming not only ecological but also social and economical problem. The most endangered are the poorest developing countries and communities, which on the other hand produce the least greenhouse gas emissions. Polar Regions are also suffering from ice thawing and the destruction of fragile ecosystems. This huge ice-melt is caused by the air temperature increase and also by warmer ocean currents.

The Arctic ice core is disappearing. According to the scientists, its ice-foot will be thawed completely by the summer of 2013.

Arctic ice - results of the NASA observations

source: NASA

Climate change in THE CZECH REPUBLIC

Climate in the Czech Republic is moderate, at the transition between the oceanic and continental. The weather is influenced by the alternation of air masses from the Atlantic Ocean and the Eurasian continent.

Due to global warming, meteorologists are expecting a huge increase in the intensity of this air stream alternation. The projected consequences of this kind of process are frequent temperature variations, changes in precipitation patterns and more frequent extreme meteorological events, e.g. floods, snow-storms, thunderstorms, wind-storms, droughts, etc.

Trend of the period of last	Linear trend of the changes (°C/10yr)		
	Year	Winter	Summer
100 yrs	0,16	0,14	0,17
50 yrs	0,3	0,34	0,3
25 yrs	0,45	0,45	0,65
10 yrs	1,07	0,24	1,55

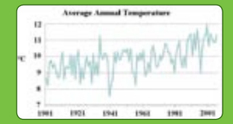
Trends of the temperature changes

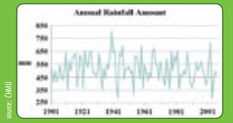
There are some negative impacts that we can already observe in the Czech Republic.

Meteorological records from our oldest historical observatory in Prague - the Clementinum - are affirming the increasing trend of global temperature in our country, as well.

The main issue concerning rainfall is the extent to which it is spread throughout the year. Extreme precipitation may cause flooding and soil erosion.

On the other hand, the last few years count among the most dry since meteorological observations began.





source: CHMI