

A step-by-step approach to combating climate change

- The Kyoto Protocol and CO₂ Law are to be implemented as matters of priority
- Further steps designed to combat climate change need to be initiated now
- In Switzerland, a considerable potential exists for reducing CO₂ emissions
- Adaptation measures are required to cope with climate change

Man's influence on the climate

International situation

Global warming. Over the past century, the mean global surface temperature has risen by 0.6°C. This increase is attributable to human activities that generate emissions of greenhouse gases. If no action is taken to reduce these emissions, the mean global surface temperature is expected to increase by 1.4–5.8°C by 2100.

Species-rich coral reefs are particularly hard hit by climate change

Source: AURA

Unprecedented concentrations of CO₂. Since 1750, atmospheric concentrations of carbon dioxide (CO₂) – the chief greenhouse gas – have risen by more than 30%, to a level that is higher than at any time during the past 420,000 years. This is mainly due to increases in the burning of oil, coal and natural gas, and to the destruction of forests.

Rising sea levels. Small Island States, such as the Maldives, and the densely populated low-lying coastal regions of Bangladesh or the Egyptian Nile Delta face the threat of inundation.

Biodiversity. The range of distribution of numerous animal and plant species will continue to shift towards the Poles and into higher altitudes. Certain endangered species whose habitat is already severely restricted may become extinct.

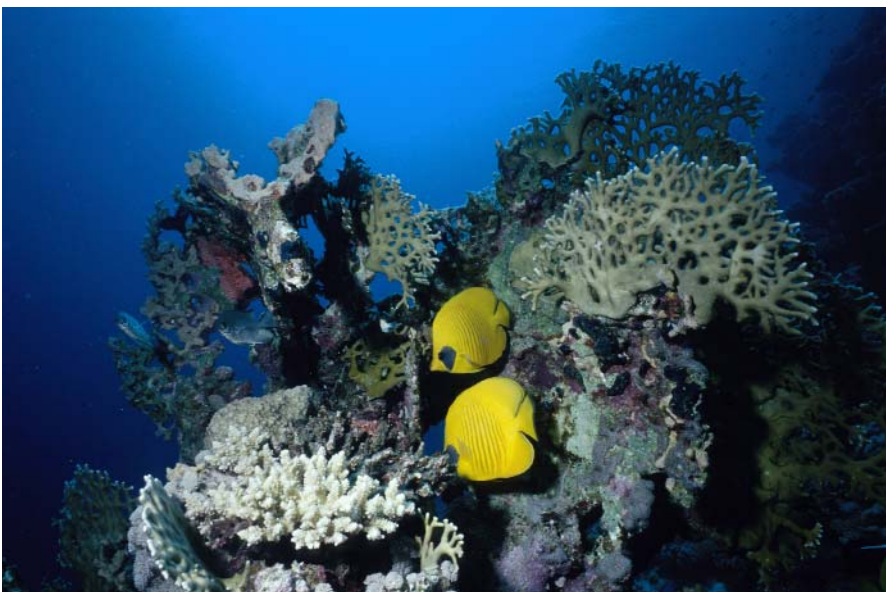
Health. Heatwaves, to which the elderly and the sick are especially vulnerable, could become more frequent and intense. As a result of rising temperatures, disease vectors could proliferate, leading e.g. to the spread of malaria.

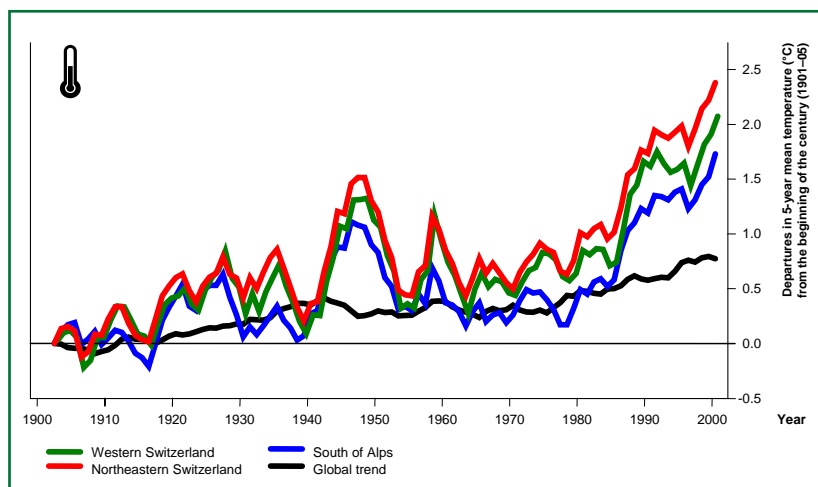
Social conflicts. Climate change could lead to shortages of water and food, thus triggering wars and mass migrations.

Switzerland

Summer 2003: Rio-like climate. In Switzerland, climate change will take the form of higher temperatures, drier summers and wetter winters. The summer of 2003 was the hottest since records began: in the warmest lowland regions, the mean temperature of 23–25°C matched the climatic conditions of Rio de Janeiro. It is anticipated that by the late twenty-first century one summer in two could be at least as hot as in 2003.

Natural disasters and extreme weather periods. These are to be expected as a result of climate change. Particularly exposed to these





Temperature trends for three regions of Switzerland, compared with the global trend

Source: MeteoSwiss/ProClim/IPCC

risks are traffic routes and developed areas close to rivers, tourist facilities in the mountains, the agricultural and fishery sectors, and key ecosystems such as mountain forests.

Tourism. Winter tourism is particularly vulnerable at lower altitudes, where precipitation increasingly takes the form of rain as temperatures rise. In the mountains, the summer tourist trade has to contend with an increased risk of rockfalls and landscape becoming less attractive as glaciers retreat.

Hydrological balance. In the longer term, the compensatory effects of melting glaciers on water flows in rivers are lost. The consequences are more pronounced high-water peaks in the winter and spring, and extremely low water levels in the autumn. This will also affect hydroelectric power generation.

Action taken to date

Internationally

Climate Convention. With the aim of reducing anthropogenic disruption of the climate, 155 nations signed the Convention on Climate Change in Rio de Janeiro in 1992. This agreement calls for stabilization of concentrations of greenhouse gases in the atmosphere.

Kyoto Protocol. Implementation of the Kyoto Protocol, which was adopted in 1997, is currently under way. It has already been ratified by, for example, the European Union, Japan and Canada. It will be able to enter into force if it is also ratified by Russia. Switzerland ratified the Kyoto Protocol in July 2003.

In Switzerland

CO₂ Law. Fossil-based energy consumption accounts for about 80% of greenhouse gas emissions in Switzerland. This is addressed by the binding reduction targets specified in the CO₂ Law: by 2010, energy-related CO₂ emissions are to be reduced by 10% compared with 1990 levels. As part of this goal, a reduction target of 15% has been set for CO₂ emissions from heating fuels and 8% for those from motor fuels.

Voluntary measures. These targets are to be met primarily through voluntary measures. An incentive tax is only to be levied on fossil fuels if these and other measures to reduce CO₂ emissions prove inadequate. Compared with 1990 levels, CO₂ emissions have stabilized overall. While a slight reduction has been achieved with regard to heating fuels, transport-related emissions have increased substantially.

Protective forest management and engineering structures. In a densely populated mountainous country such as Switzerland, protection against natural hazards is a significant issue. Traditionally, forests have played a key role in this respect, and forest management and upkeep are therefore of major importance. In areas that lack protective forest, the federal government supports the development of engineering structures.

Risk management. In efforts to protect against natural hazards, the federal government also supports integrated risk management. Priority is accorded to the use of hazard maps, monitoring stations and early-warning systems to protect life and property, as in general these measures compare favourably with engineering structures in terms of costs and effectiveness.

Agenda for the future

Internationally

Kyoto II. The Kyoto Protocol, which sets reduction targets to be achieved by industrialized countries by 2008–2012, is merely the first step in a lengthy process. Global emissions of greenhouse gases need to be reduced to a greater extent than is envisaged in the Protocol. To avoid any dangerous disruption of the climate system, industrialized nations' emissions would need to be at least 70% lower than 1990 levels. Emission trends in developing countries also give cause for concern. The gap between the two groups is closing: it is estimated that by 2020, developing countries will account for half of all greenhouse gas emissions worldwide.

Promotion of technological innovation. The development of clean technologies needs to be promoted and their use increased. Developing countries should also be able to benefit from such advances. Industrialized nations have a particular responsibility as, while they account for 20% of the world's population, they currently generate 60% of global CO₂ emissions. The United States alone (with 4.5% of the global population) produces around a quarter of all CO₂ emissions deriving from fossil-based energy consumption. In spite of the Kyoto Protocol – which the United States does not wish to ratify – OECD countries' emissions will continue to increase in the years ahead, according to the International Energy Agency.

Adaptation measures. In 2001, the Intergovernmental Panel on Climate Change pointed out that even if greenhouse gas emissions were now substantially reduced, warming of the climate would continue for decades or centuries to come. Consequently, measures for adapting to this new situation need to be envisaged without delay.

In Switzerland

Reversing slippage. Mathematical modelling indicates how far Switzerland is from achieving the reduction targets laid down in the CO₂ Law. According to the latest CO₂ projections issued at the start of 2004, there is a major discrepancy between actual and target levels of CO₂ output. For 2010, this amounts to 2.6 million tonnes of CO₂ emissions from motor fuels and 0.9 million tonnes from heating fuels.

“Climate-cent” or CO₂ tax? The need for action is particularly pressing in the case of motor fuels. To avoid the introduction of a CO₂ tax, the Swiss Oil Association (EV/UP) put forward the idea of a “climate-cent” (CHF 0.01 per litre on petrol and diesel), to be levied by the private sector. The Federal Council is to decide on the next steps before the summer recess (situation as of the end of May 2004).

Wood as a source of energy. Switzerland has the opportunity to use its abundant timber resources in the interests of climate protection. There is considerable scope for power supplies to be derived increasingly from wood, a carbon-neutral source of energy.

Substantial room for improvement in energy efficiency. In the heating and road transport sectors, Switzerland has a long way to go to achieve the energy savings that are now technically feasible and economically rational. Programmes such as SwissEnergy, support provided at the federal, cantonal and communal level, and commitment on the part of companies and individuals are important factors in ensuring that Switzerland makes its contribution to international climate protection efforts and in the long term reduces its emissions to an acceptable level – i.e. around 1.5–2 tonnes of CO₂ per capita (about four times lower than at present).

Residual water flow regulations / climate protection. Carbon-free hydropower generation makes a significant contribution to climate protection. However, from the point of view of climate policy, there is no need for regulations on minimum residual water flows to be relaxed

(cf. “Water” factsheet) – as has recently been demanded in various quarters – since less rigorous requirements would lead to only an insignificant increase in power generation. The limited potential can be illustrated by the following comparison: between 1992 and 2002, the loss of output from hydropower plants due to residual flow requirements was estimated at 60–70 gigawatt-hours. Over the same period, hydropower production nationwide rose by 2000 gigawatt-hours as a result of expansion and process optimization. The reduction in CO₂ emissions that could be achieved by relaxing residual flow requirements is much too trivial for the resultant impacts on watercourses to be justified.

Adaptation strategies. Because climate change creates new hazards or may aggravate existing hazards, adaptation strategies are also required. In addition to hazard preparedness, Switzerland will increasingly need to address the insidious changes associated with rising temperatures and altered precipitation patterns. These necessitate adaptations in the use of natural resources (agriculture and forestry, tourism, hydropower, etc.) and in developed areas, as well as adaptation of individual behaviour.



Debris flow protection works above Pontresina (Engadine)

Photo: Markus Nauser

Useful links

- <http://www.environment-switzerland.ch/climate>
- <http://www.climate-change.ch>

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