



Climate change

Reducing energy consumption – without sacrificing comfort

Background

Warming not attributable to natural variations. In the Third Assessment Report published by the Intergovernmental Panel on Climate Change (IPCC) in 2001, the authors come to an alarming conclusion: “most of the warming observed over the last 50 years is attributable to human activities.”

CO₂ concentrations higher than ever. Concentrations of carbon dioxide (CO₂) in the atmosphere have risen by more than 30% since 1750. CO₂ is the most important greenhouse gas, as its relative contribution to global warming is around 60%. CO₂ levels are currently higher than at any time during the past 420,000 years. This increase is mainly due to the burning of oil, coal and gas. Over the last 20 years, about three quarters of the total anthropogenic emissions of CO₂ into the atmosphere has been attributable to the use of fossil fuels. The remainder has been due to the destruction of forests, and to clearance by burning in particular.

Threats facing humans and the environment

- **Temperature:** By 2100, the mean global surface temperature may rise by 1.4–5.8°C.
- **Sea levels:** Small island states such as the Maldives and densely populated low-lying coastal regions in Bangladesh or the Nile delta may be inundated. During the twentieth century, mean sea levels rose by 10–20 cm. This century, rises of between 9 and 88 cm are projected under various scenarios.
- **Glaciers and snow cover:** By 1970, Alpine glaciers had lost a third of their areal extent and more than half of their mass. In recent years, they have retreated by a further 25%. Since 1960, the area covered by snow has also decreased, by about 10%.
- **Permafrost:** The frozen moisture that holds loose rocks together in the subsoil is thawing. Over the last hundred years, the lower limit of the permafrost has risen by 150–250 metres, leading to an increased risk of landslides and rockfalls in previously stable areas.
- **Biodiversity:** Today we are already witnessing changes in our part of the world: plants are flowering considerably earlier, and migratory birds are arriving and breeding earlier than in the past. The range of numerous species of plants and wildlife will continue to shift northwards and to higher altitudes. Certain threatened species whose habitats are already severely restricted face a risk of extinction.
- **Natural disasters, floods and storms, landslides and avalanches:** Global models indicate that when the temperature of the atmosphere rises by 1°C, 7% more moisture can be absorbed. According to IPCC experts, precipitation levels in the Northern hemisphere already increased by 5–10% during the twentieth century.
- **Health:** More frequent extreme events, such as heat waves, have a direct impact, affecting the elderly and the sick particularly severely. But serious consequences may also arise indirectly, e.g. when rising temperatures promote the spread of disease vectors. For example, mosquitoes are increasingly carrying malaria to previously unaffected regions. Hardest hit are the poor in developing countries.
- **Economy:** Insurers, reinsurance companies and banks are concerned about rising costs, and adjustments will be required in the energy, construction and agricultural sectors. At lower altitudes in Switzerland’s mountains, where snowfall is becoming scarce, there is a risk of a serious decline in winter tourism revenues. In general, more frequent flooding and heat-related disasters are likely to take their toll on human settlements.
- **Social conflicts:** Wars and mass migrations may be triggered by climate change.

Measures taken to date

In Switzerland

- **CO₂ Law.** The core element of Swiss climate policy is the CO₂ Law, which came into force on 1 May 2000: by 2010, CO₂ emissions are to be reduced by 10% overall, compared with 1990 levels, with a 15% cut in emissions from heating fuels and 8% for motor fuels. The targets set by the CO₂ Law are not yet within reach. At the beginning of 2004, a decision will be taken as to whether a CO₂ levy is required and, if so, at what rate it should be set.
- **Voluntary measures by industry.** In 1999, Swiss industry signalled its willingness to help reduce CO₂ emissions, by setting up the Industrial Energy Agency (EnAW). Altogether, almost 1000 companies have become involved in the process through this agency. These companies account for more than a quarter of total industrial emissions of CO₂, i.e. about 2.5 million tonnes.
- **Cement industry.** On 10 February 2003, an agreement was signed with the cement industry on targets for the reduction of CO₂ emissions.
- **Car importers.** On 19 February 2002, a voluntary agreement was signed between the Federal Department of the Environment, Transport, Energy and Communications (DETEC) and car importers (represented by auto-schweiz) on reducing the “specific fuel consumption” of new vehicles. By 2008, average fuel consumption per 100 km is to be reduced from 8.4 to 6.4 litres.
- **Buildings.** In the summer of 2002, a performance agreement was concluded with the MINERGIE Association for the buildings sector. Under this agreement, MINERGIE has undertaken to develop a joint strategy with the cantonal authorities and to provide support for implementation. The aim is to increase the proportion of buildings meeting Minergie standards to 15% for new buildings and 4% in the case of complete renovations.

Internationally

- **Kyoto Protocol.** Internationally, implementation of the Kyoto Protocol is under way. It has already been ratified by the EU, Japan and Canada, among others. If Russia follows suit, the Protocol will be able to enter into force. The Swiss ratification process is well under way. The agreement was approved by the Council of States (Swiss upper chamber) in December 2002, and the National Council is due to vote on the issue during the 2003 summer session.
- **Global Environment Facility (GEF).** The GEF, which supports projects relevant to the global environment, is currently the most important funding instrument in the environmental sector. Serving on the GEF Council, SAEFL Director Philippe Roch represents the interests not only of Switzerland, but also of the Helvetistan group, which includes Azerbaijan and the Central Asian republics of Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan.

Agenda for the future

Kyoto II. The Kyoto Protocol, which sets reduction targets for industrialized nations for the period from 2008 to 2012, is a small step on a long road. Global greenhouse gas (GHG) emissions will have to be lowered beyond the Kyoto target levels. To prevent dangerous interference with the climate system, experts recommend that industrialized nations' emissions should be stabilized at a level 70% below those of 1990. Attention should also be paid to emission trends in developing countries. The gap is closing, and it is estimated that before 2020 these nations will already account for half of total global GHG emissions.

Support for technological developments. The development and increased use of clean technologies will need to be supported, and the benefits should also be enjoyed by developing countries. The countries of the North bear a particular responsibility: accounting for only 20% of the world's population, they generate 60% of global CO₂ emissions. About a quarter of global CO₂ emissions from fossil fuels derive from the US, which is home to only 4.5% of the world's population. In spite of the Kyoto Protocol, which has been rejected by the US, the International Energy Agency projects that OECD countries' emissions will continue to rise in the coming years.

Blueprint for a "2000 watt society". Without sacrificing any comfort, our society could consume much less energy than it does today. In view of the need for a drastic cut in CO₂ emissions (see above), the Swiss Federal Institute of Technology (ETH) in Zurich has developed a blueprint for a "2000-watt society". According to this model, energy consumption per capita could be reduced to 2000 watts from the current level of 6000 watts without any significant loss of comfort. The target level is equivalent to the power consumed by twenty permanently lit 100-watt bulbs: in 2050, this should be sufficient to satisfy an individual's total requirements for transport, heating, light and "embodied energy" in consumer goods. However, to meet the criterion of sustainability, only a quarter of this power can be derived from non-renewable sources. If 25% of the future – climate-friendly – individual energy budget were allocated to transport, this would be sufficient, for example, to travel a distance of around 13,500 km each year in a petrol-driven car with a fuel consumption of 3 litres/100 km (or in a hydrogen-powered vehicle).

Web links:

http://www.umwelt-schweiz.ch/buwal/eng/fachgebiete/fg_klima/politik/index.html

(CO₂ Law, Kyoto Protocol)

http://www.umwelt-schweiz.ch/buwal/de/fachgebiete/fg_klima/daten/co2-stat/index.html

(GHG emissions; in French, German, Italian)

http://www.umwelt-schweiz.ch/buwal/eng/fachgebiete/fg_klima/service/index.html

(Climate change publication)

Further information:

Philippe Roch, SAEFL Director, Tel. +41 (0)79 277 51 88