

Spotlight on climate in Switzerland

Briefly explained

The average surface temperature of the Earth has seen extraordinarily large increases since the middle of the 20th century – and we know why. It is primarily we humans who change the earth's energy balance by releasing greenhouse gases into the atmosphere. Because of the particular sensitivity of its natural systems to climate change, Switzerland has a vested interest in a quick and comprehensive shift by the international community to a carbon-neutral economy and lifestyle.

Increasing temperatures

Most industrial processes draw energy directly or indirectly from oil, natural gas, petrol and coal, all of which emit carbon dioxide. This CO₂ accumulates in the atmosphere and warms our planet. On average, the global temperature has risen by 0.85 degrees Celsius since the middle of the 19th century.

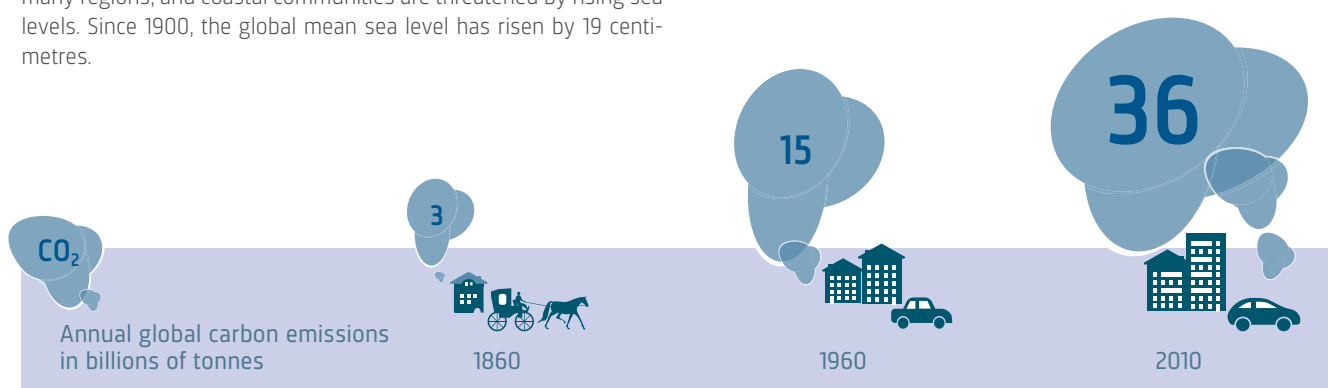
What's the problem?

As temperatures rise, precipitation and evaporation change, wind currents and ocean currents shift and the ice sheets in Greenland and Antarctica and the glaciers in the Alps begin to melt. The frequency and intensity of extreme weather events also increase. These changes have a negative impact on many people. For instance, droughts destroy crops, water is becoming a scarce commodity in many regions, and coastal communities are threatened by rising sea levels. Since 1900, the global mean sea level has risen by 19 centimetres.

And in Switzerland?

The average annual temperature in Switzerland has increased by 1.8 degrees Celsius since the middle of the 19th century. The seasons have changed. The number of tropical nights in Switzerland's Central Plateau could increase tenfold by the end of the century, while the number of frost days could decline by more than half.

With less snowfall and melting glaciers, the Swiss Alpine region is undergoing dramatic changes in terms of water levels and landscape – with negative consequences for winter tourism and agriculture. Prolonged heat waves and dry spells have a negative impact on people, plants and animals.



The Alpine region has been warming at a rate of around twice the global average. Natural habitats and agricultural regions throughout Switzerland are exposed in many ways to the effects of climate change:



Lakes and rivers

- ▲ Drier summers with reduced drainage are increasing in frequency. This is due to decreasing precipitation in the summer and significantly diminished quantities of meltwater from snow and ice.
- ▲ In fact, snowmelt in the winter is on the rise. Winter precipitation is increasingly occurring in the form of rain, which also contributes directly to meltwater drainage.
- ▲ Higher temperatures prolong the flood season, and more frequent torrential downpours are making flash flooding a more regular occurrence.

Plants and animals

- ▲ Many plants and animals that are averse to hotter and drier conditions are migrating to higher elevations, and risk facing higher competition in diminished habitats.
- ▲ Certain species are restricted to gradual migration, or migration to lowland habitats that lack corridors to more favourable habitats.
- ▲ Our flora and fauna are facing altered seasonal cycles. This can disrupt critical species interaction, for instance when insects miss the flowering season.

Mountains, snow and ice

- ▲ The glaciers in the Swiss Alps are shrinking, and are likely, for the most part, to disappear altogether by the end of the century.
- ▲ A new landscape of bare rock and scree is emerging in the high mountain regions, with sparse vegetation and an abundance of, for the most part, small lakes. The lakes increase the potential for natural hazards, whilst also offering potential beneficial uses.
- ▲ The snow season will reduce by several weeks and the elevation of the snow line is set to rise by several hundred metres.
- ▲ Permafrost in the high mountain regions will continue to decrease in depth, which is likely to lead to more frequent rockfall and rockslides.

Weather extremes

- ▲ With rising temperatures, more frequent and prolonged heat waves can be expected, with even more intense temperature spikes in the summer – a trend which is already being observed now.
- ▲ Heavy precipitation is expected to occur more frequently and with greater intensity, triggering more frequent mudslides, landslides and flooding.
- ▲ The risk of drought is increasing. Overall, precipitation is expected to occur on fewer days in the summer months, and longer dry periods are predicted.

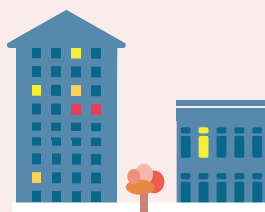
Impacts and risks

Infrastructures



- ▲ Is Switzerland prepared for more frequent extreme weather events? Weather extremes in the future may put hospitals and emergency services under greater pressure than ever.
- ▲ A world largely independent from fossil fuels requires different infrastructures from those in today's world (expressways, airports and electricity networks), thus current infrastructure investments may later prove to be unprofitable, and put jobs at risk.
- ▲ Infrastructure such as ski lifts or avalanche barriers currently built on permafrost terrain could lose their stable bedrock.

Cities and villages



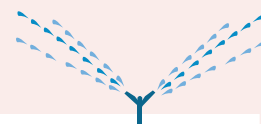
- ▲ Hot summers transform cities into urban heat islands. Heat stress in our cities is one of the major challenges associated with climate change. Around 1,000 heat-related deaths occurred in Switzerland in the summers of 2003 and 2015.
- ▲ Our cities and villages will be increasingly exposed to floods. Most of the large cities are located close to bodies of water.
- ▲ Milder winters mean a decrease in the need for heating; however, the energy thus saved is outweighed by the demand for cooling in summer.

Forests and fields



- ▲ Spruce trees are threatened with eventual disappearance from Switzerland's Central Plateau, and the species is also under threat in high-elevation protection forests. Central to the Swiss timber industry, spruce fares poorly in dry conditions, and is suffering from the effects of the rapidly expanding pine beetle population.
- ▲ Warmer conditions will make it more difficult to cultivate certain crops such as winter wheat and potatoes. In contrast, yields of maize and grapes can be expected to rise, so long as precipitation remains sufficient.
- ▲ Agricultural pests such as the codling moth are likely to produce two to three generations a year instead of the current one to two generations.

Water resources



- ▲ Water scarcity in the summer impacts on all water users, and particularly on agriculture, where there is increasing dependence on irrigation. In Switzerland, competing claims to water resources are likely to intensify.
- ▲ Glacial shrinkage and reductions in snow cover and, thus, diminished natural water storage, increase the need for multipurpose reservoirs.

- ▲ Impacts and risks
- ★ Mitigation
- Adaptation



Responding to climate change

If global warming is to be held to less than two degrees Celsius as agreed by the global community, carbon emissions need to be reduced quickly. Net emissions will have to be lowered to zero in the medium term. There is much potential for mitigating climate-related risks and creating an environmentally sustainable society and economy.

Mitigation: We have an influence on climate change by reducing greenhouse gas emissions or, better still, by avoiding them. That will allow us to curb the rise in temperature.

Mitigation

Adaptation: We can respond to the challenge of climate change by minimising risks and exploiting opportunities.

Adaptation



Commuting and travel

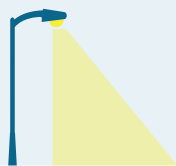
- ★ Reduced commuting: Modern telecommunications permit working from home and video conferencing.
- ★ Choosing to cycle or walk more often promotes fitness while also reducing motorised traffic.
- ★ Smart city planning: Travel distances are kept to a minimum when residential, shopping, working and recreational areas are in close proximity to one another.
- ★ Less air travel and, consequently, longer holidays or a greater number spent in Switzerland will lower travel stress while also cutting carbon emissions.
- ★ Purchasing fuel-saving, low-emission vehicles with appropriately-powered engines promotes energy efficiency.





Home heating and cooling

- Parks, shade trees and open bodies of water help to mitigate the urban heat island effect and thereby enhance quality of life in cities.
- ★ Well-insulated buildings help to lower demand for heating in the winter, as well as keeping homes cool in the summer. Nevertheless, climate-appropriate design involves more than just insulation. For instance, smart architectural design should also contribute to the natural airflow in cities.
- ★ Solar installations, heat pumps, combined heat and power systems and district heating grids can be used to replace inefficient oil and gas-heating systems.



Energy consumption

- ★ Carbon-neutral energy procurement and use can be promoted through the introduction of legislation to restrict carbon emissions and energy consumption, embracing price-signalling options and accounting for external costs.
- ★ Energy labels for products and buildings encourage consumers to purchase energy-efficient appliances and systems.
- ★ Behavioural changes, such as switching off devices after use or reducing consumption in general, can reduce energy demand.
- ★ Where energy is saved in one place, it is often consumed in another. For instance, the money saved by purchasing a more efficient heating system is spent on an additional holiday. Those who are aware of this tendency can avoid it.



Eating and drinking

- Water can be conserved through a smart approach to irrigation. Sustainably-cultivated soil improves water retention, and winter grains such as winter barley and rapeseed have lower water requirements. Efficient irrigation systems that minimise water loss are increasingly being introduced in many areas of Switzerland's Central Plateau.
- ★ Every individual can take responsibility to reduce food waste, consume less meat and lower overall food intake. This represents a simple and straightforward way to significantly reduce carbon emissions.



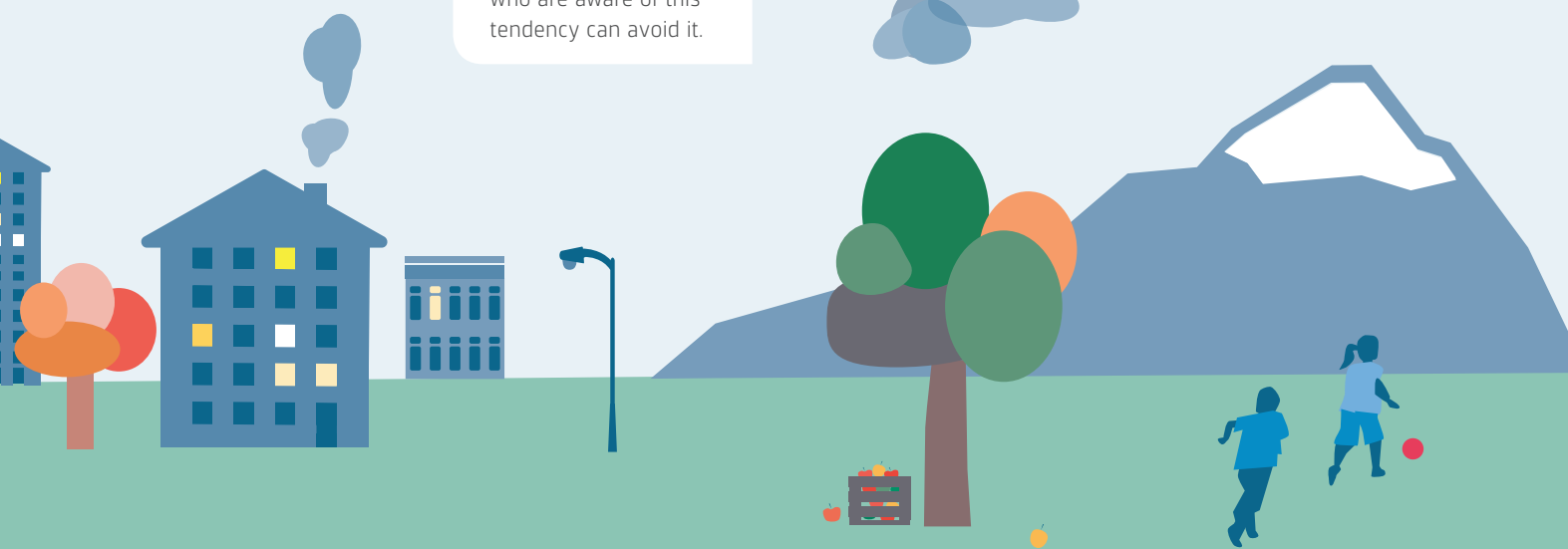
Staying healthy

- Adapting to the heat: It is important to drink sufficient fluids, avoid the sun and replenish the body with water and minerals after sports activities.
- Citizens should obtain information about the spread of diseases, and how to protect oneself, for example, against newly-introduced, mosquito-borne diseases, or diseases resulting from shifts in tick populations.



Active participation

- ★ Individuals can all make greater use of their civil liberties to promote smart climate policies and help to shape the future.



Swiss climate – today and tomorrow

Avoiding carbon emissions

Global warming can be reversed in the long term if we can significantly reduce the greenhouse gases we generate. This is why we need to reconfigure our energy systems, our buildings and infrastructures, our transport systems and our industries with an eye to protecting the climate. This also requires a commitment on the part of the politicians.

Smart investments

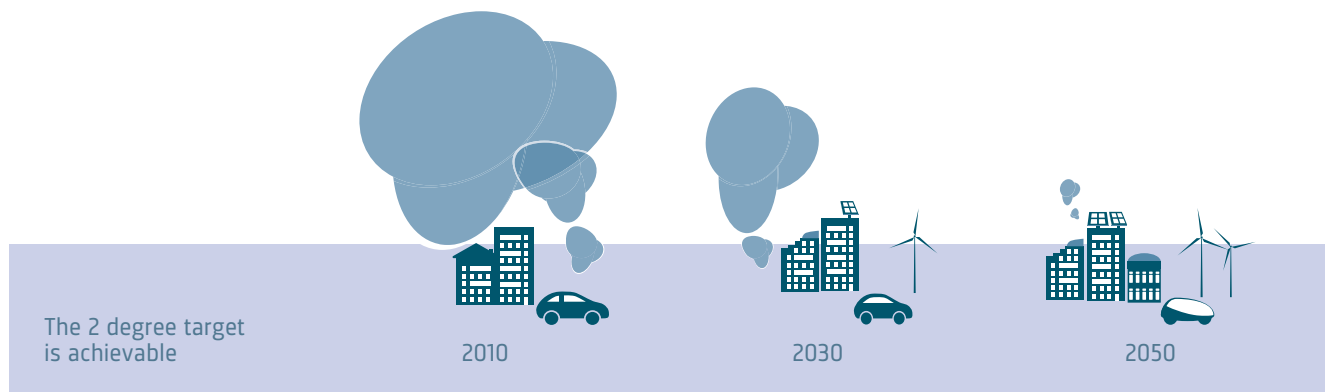
We are laying the groundwork today for a climate-friendly world in the future. The investment decisions we make today in buildings and infrastructure will dictate whether we use more energy and release more carbon dioxide in the coming decades, or less. This presents many opportunities for innovation. Investments abroad should also focus more on climate-friendly and less on energy-intensive enterprises.

International coordination

Joint global action to combat climate change is important to the people of Switzerland. The Paris Agreement of the United Nations in 2015 strengthens the framework for globally coordinated efforts to protect the climate. The goal is to limit the increase in the global average temperature to well below two degrees Celsius compared to pre-industrial levels. The agreement has already been ratified by 148 countries and has been in effect since 4 November 2016. The Swiss parliament ratified the Paris Agreement in June 2017.

Let's get started!

Measures to combat climate change bring considerable social benefits. The technical challenges accelerate innovation and create new jobs; reduced traffic and emissions promote health and quality of life, and optimised buildings offer improved living and working conditions.



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