



## A climate target for Switzerland – How much ambition can we afford?

*This Climate Press is based on the OcCC report  
«Climate targets and emission reductions – An analysis and political vision for Switzerland»<sup>1</sup>*

**The international community has agreed on the target to limit global warming to 2 degrees. This means that CO<sub>2</sub> emissions have to be reduced quickly and substantially. On the international level it is not clear so far how to achieve that aim: The reduction measures announced will not be sufficient.**

**What contribution is Switzerland able and willing to make? A global agreement cannot be expected in the near future. However, Switzerland does have alternatives to establish a forward-looking climate policy. An ambitious climate target would have advantages and disadvantages. In any case, however, it would be economically viable.**

### It is getting warmer

It is largely undisputed that global warming is taking place. In Switzerland, temperatures have increased by 1.7 degrees since the 19th century and, within the same time frame, the global mean has increased by 0.74 degrees. Until 2100, the warming will amount to 3 to 5 degrees in Switzerland, unless emissions are reduced. Melting of glaciers and thawing of permafrost soils will accompany the warming, and the frequency and intensity of extreme weather events, particularly of heat waves, will rise. Furthermore, plants and animals, the economy (e.g. tourism) and public health will be affected. The consequences will be the more severe and expensive, the stronger and faster the warming.

### The memory of the atmosphere

Carbon dioxide (CO<sub>2</sub>) is the most important factor in global warming. The warming can be halted only if we succeed in reducing greenhouse gas emissions drastically in the near future. The international community has reinforced its commitment to the 2 degrees target at the climate conference in Durban in order to prevent dangerous consequences of climate change as far as possible. The 2 degrees target would mean a warming of between 1 and 2 degrees in Switzerland in comparison to today. Currently, the annual CO<sub>2</sub> emissions, which are still on the rise, are far too high to attain the 2 degrees target. CO<sub>2</sub> remains in the atmosphere for a long time. It accumulates there and is effective for centuries, even millennia.

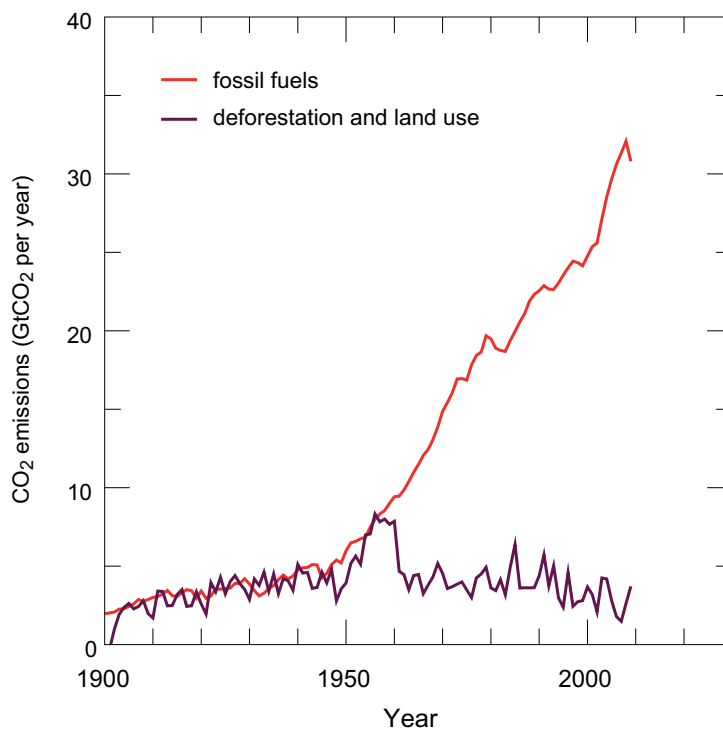


Figure 1: CO<sub>2</sub> emissions from the use of fossil fuels (in red, including the share from cement production) and due to land use changes. Data source: Marland et al. ([http://cdiac.ornl.gov/trends/emis/meth\\_reg.html](http://cdiac.ornl.gov/trends/emis/meth_reg.html)) und Stocker et al. (2011).

Therefore, emissions have to be reduced quickly and to approach zero if the 2 degrees target is to have a real chance.

### Vague declarations of intent on the global level

The most recent global conferences within the framework of the UN Climate Change Convention did not achieve any progress towards a follow-up agreement to the Kyoto Protocol: Whereas the large majority of states emphasise the importance of limiting global warming, the only outcome on the international level are resolutions and declarations of intent without any obligations. Certain states or groups of states like the EU do make an effort not only to formulate targets but also to take measures. However, in other countries, such as China or India, emissions rise steeply. These countries argue that the highly industrialised countries have developed at the cost of the climate and they claim the same right to progress for themselves. This justification is comprehensible and shows how difficult it will be to reduce emissions globally and jointly.

The starting point for a global agreement is the global emission budget. It comprises the entire global greenhouse gas emissions and refers to a longer time period, for instance until the end of the century. This serves to determine the extent to which emissions would have to be reduced over time and how much individual countries would be allowed to emit.

### A «just» distribution

How can the global emission budget be fairly distributed among the states? It will be difficult to achieve a consensus regarding this question since opinions are deeply divided:

- The developing countries are generally in favour of a proportional distribution of the budget based on the population; that is, the quantity of emissions allowed per capita is multiplied by the number of people. This claim may seem demanding to industrialised countries. In fact, however, they are favoured with regard to the total of emissions, because past emissions are not considered although they are the main cause for the current greenhouse gas concentration.
- The industrialised countries are in favour of the «grandfathering» scheme. That is, the level of emissions is taken into consideration, as it is the case, for instance, in the Kyoto Protocol. There, the emission reduction is formulated as a percentage of the 1990 level.
- It is also possible to combine the two approaches. This would mean that per capita emissions would converge slowly.

The above-mentioned approaches are based on a just distribution of the budget. Differences in the economic capacities of the countries remain, how-

### **Reduction within the country or abroad**

From a political and, in particular, from an economic point of view, setting a climate target will lead to the question of whether emission reductions should be achieved within the country or abroad. Some important aspects with regard to this question are discussed in the following sections:

#### ***Additionality***

Financing measures abroad only makes sense if the emission reduction achieved is additional. Would the reduction have been realised without the technical or financial contribution in question? If a project is not additional, the measure is not even climate-neutral, but even increases greenhouse gas concentration in the atmosphere: Because, firstly, the reduction in the developing country would have been achieved anyway and, secondly, the donor country gets emission credits, meaning that it is allowed to emit more CO<sub>2</sub>.

#### ***Atmospheric greenhouse gas emissions***

Important greenhouse gases such as CO<sub>2</sub> are distributed evenly in the atmosphere and it does not matter with regard to the climate where the emissions are reduced. This means that independently of whether Switzerland reduces emissions within the country or abroad, atmospheric greenhouse gas concentration decreases by the same amount (provided the above-mentioned additionality applies).

#### ***Benefit of measures within the country***

If a domestic company takes measures to reduce CO<sub>2</sub> emissions, this involves not only costs. Depending on the kind of measure (improvement in efficiency, replacement of fossil energy sources by renewable energy sources, technological innovation), it also means cost savings, technological progress or improved competitiveness. On the other hand, if measures are realised abroad, this involves costs only; the positive side-effects within the country are missing.

#### ***Rebound effects***

Rebound effects refer to the fact that savings or improvements in efficiency are partly or entirely compensated by increased use or consumption. This effect is encountered frequently in the case of financing emission-reduction projects in developing countries. For instance, building a (low-carbon) electricity production plant in a developing country results in an increase of the scarce energy supply and therefore in an increase of electricity use.

#### ***Transfer of technology and knowledge***

As a positive side-effect, projects for the reduction of greenhouse gas emissions may enhance the transfer of technology and know-how to the developing or transition country concerned and thereby contribute to its development.

#### ***Low-hanging fruits***

Financing emission-reduction measures abroad contains the risk of exploiting the cheap potential reductions in the country concerned. Such countries will be faced with a difficult task if they want to or have to reduce their emissions themselves in the future.

ever, disregarded; that is, fairness of the distribution is given greater weight than fairness of the burden. This is primarily due to practical reasons, because ensuring fairness of the burden would entail very complex rules.

In addition, the determination and distribution of the global emission budget is made even more difficult by the fact that it cannot be established exactly how quickly and how strongly emissions have to be reduced in order to largely control the consequences and risks of global warming. An international agreement on the distribution of the global emission budget is likely to be postponed further.

If Switzerland was to take the decision to make an «adequate contribution» to climate protection,

the question would arise what that contribution should amount to.

### **An adequate contribution of Switzerland**

What contribution to climate protection would be adequate for Switzerland? The UN Climate Change Convention (UNFCCC) formulates: «The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof.» Even with this definition, it is far from evident how the climate

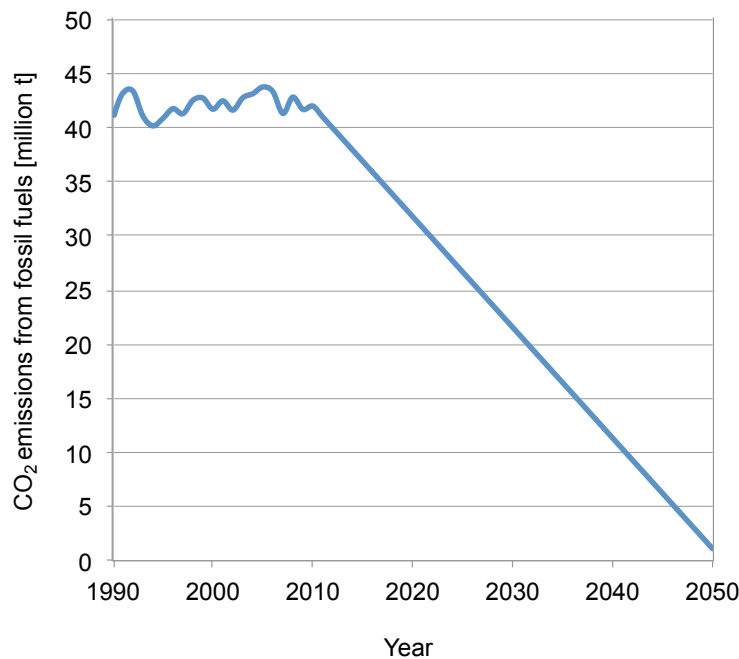


Figure 2: The graph shows a course of CO<sub>2</sub> emissions in Switzerland compatible with an emission budget of 840 million tons of CO<sub>2</sub> for the period between 2010 and 2050.

Source: OcCC: Klimaziele und Emissionsreduktion – Eine Analyse und politische Vision für die Schweiz (2012).<sup>1</sup>

target for a given country is to be determined. However, it seems obvious for Switzerland to base its commitment on the efforts of countries with comparable economic and technical possibilities, such as EU members.

The current formula in the climate policy of the EU is «20-20-20». Three targets are to be achieved by 2020: Firstly, the EU aims to reduce greenhouse gas emissions by 20 per cent until 2020 in comparison to 1990, and by 30 per cent if other developed countries do the same. Secondly, the share of renewable energies is to be increased to at least 20 per cent. Thirdly, the EU seeks to increase energy efficiency in order to reduce its primary energy consumption by 20 per cent in comparison to the level forecast for 2020. The required reduction of greenhouse gas emissions will be distributed among the EU members according to point of departure and potential of the different countries.

The Swiss Federal Council has adopted the 20 per cent reduction target of the EU within the framework of the Copenhagen Accord and also integrated it in the revised CO<sub>2</sub> law. In accordance with the UNFCCC, Switzerland is to specify the exact percentage of the reduction by comparing the economic status, CO<sub>2</sub> intensity and capacity of Switzerland with the corresponding figures of the EU countries. Such an evaluation has come to the conclusion that an adequate reduction target for Switzerland would be about 25 per cent by 2020 – based on the EU targets. Evidently, further reductions will be required after 2020 if global temperatures are to be stabilised in the range of 2 degrees. Industrialised

countries, including Switzerland, should reduce their emissions by at least 80 per cent by 2050 in comparison to 1990.

### Switzerland – a pioneer?

Although per capita emissions in Switzerland are considerable and above the global mean, the country's total emissions are relatively small due to its small population. Switzerland is responsible for a fraction of global greenhouse gas emissions. On the one hand, this means that the influence which can be exerted by Switzerland on the global climate, or the primary benefit of its emission reductions, is modest. On the other hand, Switzerland could profit from secondary benefits in several respects: Acting as a pioneer, Switzerland could encourage other countries to reinforce their efforts and thereby increase its political influence. However, Switzerland's interest in getting the global community to act extends beyond such reasons of prestige: Early emission reductions will significantly reduce future adaptation costs, whereas a stronger warming will probably result in a disproportionate increase in costs.

### Benefits and costs of an ambitious climate policy

With an ambitious political climate target and a corresponding energy policy – improved efficiency, expansion of renewable energies, development and use of new technologies – Switzerland could reduce its dependency on energy imports and therefore its dependency on other countries.



Figure 3: Photovoltaic system installed on the «P+R de l'Étoile» car park in Geneva. Foto: Services industriels de Genève, SIG.

Innovation and productivity (e.g. of CleanTech products) would be enhanced. Furthermore, positive effects on public health could be expected as a result of a lower concentration of pollutants in the air. Productivity and income losses due to illness as well as costs of treatments would be reduced. Finally, a lower concentration of pollutants would also mean a decrease in building and material damage.

Opposite these benefits are the costs of a corresponding climate policy. The costs can be calculated more easily than the benefits; however, such calculations include the actual costs of climate protection measures only. External costs, that is the damage resulting from an unabated climate change for Switzerland or for the planet, are not taken into consideration. Should Switzerland decide to make a contribution to climate protection, it could set its contribution quite selfishly by maximising the difference between costs and benefits and calculating the optimum CO<sub>2</sub> reduction.

#### Economic effects of a CO<sub>2</sub> reduction

Several studies have examined the economic effects of reduction targets. Even if their results vary due to different time horizons, models and assumptions, they mostly come to the conclusion that for Switzerland, a reduction of 30 per cent by 2020 and of 80 per cent by 2050 is manageable. The costs are considered as small to moderate: Model results suggest a reduction of the annual economic growth rate by 0.1 to

0.2 percentage points and a loss of welfare of below 2.5 per cent. These estimates are based on the assumption that Switzerland does not set its targets within the framework of an international agreement. In the case of international coordination, the costs for Switzerland would probably be smaller.

In Switzerland, a reduction of CO<sub>2</sub> emissions requires a change in people's attitudes, which can be achieved by means of rules or by means of market-based mechanisms, such as ordinary taxes or 'steering' taxes. Such measures will cause a redistribution within the Swiss economy; that is, there will be winners and losers. Depending on sector, innovation and investment potential, some enterprises will profit and others will suffer. The net effect on the national economy can be calculated by means of simulations. Ideally, the advantages outweigh the negative effects of the market intervention. The net effect also depends on other countries' climate targets. The larger the differences – whether upwards or downwards – between Switzerland's and other countries' targets, the more uncertain the forecast of the economic net effect.

#### Conclusion

The current state of knowledge concerning global warming and its effects urges immediate action to be taken. Only a few would gain from maintaining the status quo. The longer reduction measures are postponed, the more difficult it



will get to slow down global warming and to prevent dangerous consequences.

On the global level, a breakthrough in climate policy is unlikely. Irrespective of this, Switzerland should set clear climate targets. This is because a commitment of Switzerland to climate protection is profitable for purely selfish reasons. Firstly, an unabated climate change would affect Switzerland considerably and be costly. Immediate action is in Switzerland's own interest. Secondly, Switzerland can profit from such an engagement by increasing its political visibility, particularly if it seeks to play a pioneering role.

Therefore, it makes sense for Switzerland to shape its climate policy in an autonomous and forward-looking manner that is adapted to its economic potential. The CO<sub>2</sub> law forms the basis for such a policy. The required structural change in order to realise a climate target will have its price; on the other hand, it will also bring advantages. Whether the costs or the benefits outweigh from a purely economic point of view cannot be determined conclusively. However, according to scientific findings, it is high time to abandon today's economic development with its high emissions and intensive use of resources. It is also undisputed that Switzerland has the economic potential to realise an ambitious climate target.

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