CO2 reduction measures (2013-2020)
Assessment of the data basis and cost-benefit considerations under the revision of the CO2 Act

Key facts

Switzerland ratified the Kyoto Protocol in 2003, committing itself to reducing its greenhouse gas emissions by a total of 8% in the first commitment period from 2008 to 2012. The legal framework for implementing Switzerland's international climate protection obligations is contained in the CO2 Act. Effective the beginning of 2013, both the Kyoto Protocol and the CO2 Act will have to be replaced. In line with the Kyoto Protocol, new reduction targets and corresponding measures will be taken for the next commitment period from 2013 to 2020.

In its meeting of 20 February 2008 on climate policy, the Federal Council initiated a revision of the CO2 Act for the time after 2012. As an indirect counterproposal to the "Popular Initiative for a Healthy Climate", the Federal Council commissioned a consultation proposal on revision of the CO2 Act, containing measures to achieve the future CO2 targets until 2020.

Mandate & goals

The present assessment focuses on instruments and measures for reducing CO2 emissions in Switzerland discussed in the spring of 2009 in connection with the consultation proposal for revision of the CO2 Act. On the basis of a synthesis of existing literature, relevant facts on the topic will be compiled. One goal of the present assessment is to analyse the existing data basis, the underlying assumptions for calculations, and the existing cost-benefit considerations pertaining to CO2 reduction measures. The present study is considered to be a supplementary and independent assessment of selected aspects relating to revision of the CO2 Act and aims to provide additional insights and assistance for the benefit of affected government offices and Parliament.

Switzerland has clear CO2 reduction targets

Under the ratified Kyoto Protocol, Switzerland has clear and binding CO2 reduction targets until 2012. These targets were legally implemented in Switzerland with the CO2 Act; the goals of the CO2 Act in Switzerland are compatible with those set forth in the Kyoto Protocol. For the coming second commitment period from 2013 to 2020, there is currently a superordinate CO2 reduction target of 20% or 30%, based on European Union targets. The Kyoto Protocol provides for sanctions where reduction obligations are not met. If a State fails to achieve its target within the commitment period, it must make up the difference in the following period, plus a 1/3 additional reduction of greenhouse gases. Moreover, the options for achieving the target using flexible mechanisms may be restricted.

For the time after 2012, Switzerland must therefore decide on more far-reaching reduction targets and measures. The proposal circulated by the Federal Council for consultations on 26 November 2008 envisages two options. As the evaluation of the consultations shows, the majority of respondents favour option 1 ("binding climate targets"), while option 2 ("binding steps toward climate neutrality") met with little support.

Targets to be achieved with a mix of instruments and measures

The revision of the CO2 Act envisages a mix of several sector-specific domestic measures as well as the use of "flexible mechanisms" to achieve the post-Kyoto targets. On the one hand, the consultation proposal focuses on technical measures within Switzerland (technical measures for buildings and vehicles), which according to existing documentation and knowledge (i) have a high reduction potential, (ii) make a high contribution to reducing CO2 emissions, and (iii) in general have positive (primary and secondary) utilisation effects. The CO2 incentive tax on fuels (partially earmarked for a building refurbishment programme), which constitutes a core element of Swiss climate strategy, and emissions trading supplement voluntary and other CO2-effective measures.

Emissions data and research results are available…

Switzerland has an extensive data basis at its disposal on various relevant topics and is undertaking to further supplement and refine it on an ongoing basis. The gathering, measurement, and reporting of emissions data on relevant greenhouse gases is carried out according to UNFCCC requirements and is thus not subject to discussion.

In addition, numerous studies exist on the future development of greenhouse gas emissions and energy demand, which are regularly adjusted. Published research reports on the potential, effectiveness, and cost-benefit analyses of CO2 reduction measures may generally be considered realistic and robust – despite various uncertainties concerning reference development and estimated potentials (see below). This is not least of all due to the fact that calculations in Switzerland are generally based on standardised methodological approaches, and research results can thus be compared with international results.

…but subject to numerous uncertainties

The abovementioned results of studies (such as development scenarios of GHG emissions, expected CO2 reduction potentials, and estimated impact of measures) are based on numerous assumptions concerning the future framework data and conditions (energy price development, oil price, population and economic growth, discount rate, lifespan of measures, duration of CO2 savings, etc.), which should always reflect the current status of information at the time of the study. Uncertainties exist in relation to the reliability and accuracy of the assumptions made, since they are subject to continuous changes. On the other hand, the scenarios and target values can only to a limited extent take into consideration (potential) implementation problems and obstacles in advance. As analyses after the fact show, however, these obstacles have a substantial impact on results and ultimately also on determination of the expected effectiveness and economic efficiency of CO2 reduction measures. Reported CO2 reduction potentials should therefore as a rule be considered upper (technical and/or economic) thresholds to be achieved in the best case – confirmed calculations and findings can only be provided after the fact, however.

Supplementary information enhances reliability and replicability of results

Numerous research results in the assessed studies (e.g. reduction potentials of a measure) are often only provided in the form of a target value. More detailed information on fluctuations and confidence intervals of results, assumptions, and estimated impact of potential obstacles are largely missing. The reporting of results (e.g. CO2 reduction performance, costs and/or benefits) in some studies or in their further use also does not always make clear whether the values apply each year, over the duration of a measure, or as a maximum reduction in the target year or a specific year

(e.g. 2020). This makes it more difficult to replicate and interpret data and results and also harbours the danger of possible misinterpretation or improper interpretation of results. Study results on reference developments require detailed consideration and statement of the underlying assumptions. Standardised reporting of relevant target values facilitates replicability, estimation of reliability, and comparability of CO2 reduction measures.

Recommendations

The results of the present assessment lead to the following recommendations for the attention of the Federal Office of the Environment (FOEN):

- **Transparent representation of basic parameters, assumptions used, and results ("technical characteristics"):** Assumptions used in studies should be reported transparently to improve replicability of calculations and interpretation of the results generated; the selection of assumptions should be briefly justified.
- **Harmonisation of key result parameters: Uniform indication of duration and time unit over which a measure achieves CO2 reductions or is calculated:** To facilitate comparison and replication, CO2 reductions should generally be reported in a uniform manner with respect to specific targets and measurement units.
- **Use of different assumptions where influencing values are uncertain:** To better estimate the effect of various measures on the research results and the interrelationships of reduction measures, calculations should more frequently be carried out with variations of relevant assumptions (as additional scenarios or suboptions) and include sensitivity analyses.
- **Continuation of specific sectoral climate indicators:** Continuous monitoring of relevant sectors and emission types facilitates observation of (undesirable) developments of greenhouse gas emissions and provides additional information on the effectiveness of reduction measures in the respective sectors. On this basis, measures can also be evaluated more effectively, and interventions can be made at an earlier stage when undesirable developments arise.

Original text in German