

# Climate Master Plan Switzerland



**Implementation  
of the Paris  
Agreement!**





### Gloss on the term CO<sub>2</sub> equivalent (CO<sub>2</sub>eq)

Various greenhouse gases are responsible for human-made climate change: carbon dioxide, methane, nitrous oxide, partly or fully fluoridated carbon hydrates, as well as sulphur hexafluoride. Due to their different relative effect, emissions are converted into CO<sub>2</sub> equivalents. The sum total of the yearly load is generally stated in tons.

### Acronyms

BEECC	Buildings energy efficiency certificate of the cantons
MuKE	Sample regulations of the cantons in the energy sector
GHG	Greenhouse gases
TWh	Terawatt hours

Further abbreviations are written out at their first occurrence in the text.

### Two pointers

#### ■ The priorities

The climate master plan focuses on the major challenges as regards emissions reduction and adaptation. It does not provide solutions for the compensation for environmental damage and loss, for technology transfer or the areas of health, information and capacity building. Equally, regarding GHG sinks, this master plan does not make any demands, since research and development can't provide any definitive solutions.

#### ■ The photos

Children and adolescents from the whole world, from all cultures, full of vital energy and great expectations for their future. For their and their children's children's sake climate change must be kept within sustainable limits.

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## Foreword

The Climate Alliance Switzerland presented its first climate master plan in 2006. Since then the research results of climate science have gained in clarity and reliability. The rapidly rising global greenhouse gas emissions and the increasingly evident damage caused by climate warming highlight the need for action. As a consequence, the Paris Agreement was signed in 2015: it aims to limit global warming to 1.5 degrees, or at least well below 2 degrees with respect to pre-industrial temperatures.

The present second Climate Master Plan shows where and how Switzerland can and must contribute to reach the goals of the Paris Agreement. The Climate Master Plan is based on the study „A Catalogue of Measures: Climate Policy 2030 for a Climate Compatible Switzerland“ (in German only) by econcept, funded by Greenpeace Switzerland, the Climate Alliance of Swiss towns, the Swiss Energy Foundation, swisscleantech and WWF Switzerland. In addition, the Master Plan is based on several White Papers concerning greenhouse gas reduction abroad. They were written by authors of the Climate Alliance.

The Climate Master Plan focuses on political measures and instruments to reduce greenhouse gases which are directly or indirectly caused or influenced by Switzerland. Hence it is a manual for decision makers at the level of central government, cantons and municipalities. The measures emphasise the framework for promoting efficiency, effectiveness and substitution. Voluntary action, frugality and cultural changes are considered important and necessary by the Climate Alliance. Nonetheless, the scope of this brochure is limited to political measures rather than being a guide to a climate-compatible lifestyle.

The Paris Agreement endeavours to reduce the climate balance to zero by 2050. This means that the remaining emissions – e.g. from the agricultural sector or from waste treatment – must be compensated in other areas by negative emissions (so-called sinks).

Most demands regard the time up to 2030. If we want to be on course as regards the global and the Swiss greenhouse gas budget, we must be half-way on the path to the zero climate balance. This is a challenge we would like and want to take up. Now!

**The 66 member organisations  
of the Climate Alliance Switzerland**



# Paris, December 15: answers to the global climate question

## Certainty

Already 150 years ago science realised that the doubling of the CO<sub>2</sub>-concentration in the atmosphere results in global warming of about 4 degrees. But only in 1990 did the first IPCC report present a summary of the results of scientific research: they were unsettling: immediately it was clear that the problem could only be solved if greenhouse gas emissions could be stabilised and reduced. The atmosphere is like a global common whose overexploitation threatens the fundamentals of our lives.

This led to the 1992 UN Framework Convention on Climate Change (UNFCCC) and 1997 to the Kyoto Protocol. It allocates to every industrialised country goals for the reduction of greenhouse gases for the years 2008 to 2012. The US never ratified the protocol and Canada opted out. There were negotiations about a second period of mandatory climate targets, but only few countries have signed up and few intend to do so. The Kyoto Protocol is currently regulating only 15% of global emissions. Too little to till the global common sustainably. At present the middle classes, who are responsible for high per capita emissions, are growing globally: greenhouse gases from emerging countries are increasing rapidly. China has ousted the US as greatest emitter. The objective of the UNFCCC to stabilise GHG emissions was conspicuously missed. Simultaneously the scientific findings that incalculable consequences will ensue if global warming exceeds 1.5° – 2° C were confirmed. Already the current CO<sub>2</sub>-concentration of 400 ppm can warm our planet dangerously. Therefore, greenhouse gases must be reduced rather than merely stabilised!

Global extreme weather events confirm the scenarios of the climate models. Climate warming is not just any problem of the distant future. Here and now it is already causing great suffering. Simultaneously the technologies to replace fossil fuels have greatly improved in the last decades and become marketable. The problem, the challenge, but also the answers, are patently obvious.

## The Paris Agreement

In December 2015 195 states agreed an ambitious climate policy: the goal is to limit global warming to well below 2° C (preferably 1.5° C). The Paris Agreement can be viewed as a constitution: only the drafting of the individual laws and guidelines will enable the Agreement and its mechanism to be implemented.

A summary of the seminal points:

- The Agreement is based on the three strategic pillars emission reduction, adaptation and dealing with loss and damage.
- It determines objectives, defines principles for national climate plans, demands transparency and monitoring.
- In principle, all countries are part of the agreement. However, no individual fixed targets have been prescribed.
- The level of economic development is taken into account. Global warming must remain well below 2° C (preferably 1.5° C).
- In the second half of this century the GHG emissions must be

## Take-home message for Switzerland:

### Vision net zero emissions

What this spells out for Switzerland is a vision of zero emissions with the goal of stabilising global warming well below 2° C and to reduce the climate balance to zero. Given a future world population of 10 billion there remains for each human life a CO<sub>2</sub> budget or roughly 70 tons (i.e. 1t CO<sub>2</sub> per annum).

If a Swiss citizen is allotted just the 5 tons of CO<sub>2</sub> emitted domestically they exhaust their budget at the latest in 14 years. If emissions were to diminish by 1% yearly (government proposal) they would have their last claim to their ton of CO<sub>2</sub> after 25 years. Or we rent a CO<sub>2</sub> sink for thousands of years, and pay for it.

Extrapolated for the entire country this means the following: if Switzerland wants to limit warming to 1.5° C, and subsequently arrive at zero emissions in 2050, it has to reduce its emissions by 50 million tons of CO<sub>2</sub> compared to today, which means a reduction of about 4% annually. (2 Mt CO<sub>2</sub>eq) In order to get onto the Paris course emission reductions are necessary wherever the state or private entities are involved in climate-relevant decisions. Basically all countries are included, but no rigid climate targets are set for all states.

reduced to net zero. If global warming is not to exceed 1.5° C, this reduction has to be achieved already by 2050.

- For the inevitable adaptation measures a global objective has been spelled out.
- For dealing with loss and damage mechanisms are to be developed since the negative climate consequences cannot be totally avoided in spite of adaptive measures.
- The industrialised resource-rich countries are to provide the necessary support so as to implement the three strategic pillars – even if a state does not have the financial capacity.
- The climate protection engagement of individual countries will be vetted and strengthened for the first time in 2018, then every five years.

The Paris Agreement is a break with the largely laissez-faire attitude as regards climate change. It paves the way towards global decarbonisation and intends to reduce the climate balance to zero. Rich countries have to support economically disadvantaged regions to render global warming bearable for humans and nature.

# The true cost – steering for future generations

## No price – no value

Flooding or drought, enormous storm damage and more and more climate – damaged humans fleeing. The concomitant burdens and costs are hardly ever priced in. Polluter-pays-principle? Nothing of the kind! The people affected and the communities bear the cost – and future generations. Economists' estimates of the climate subsequent costs vary: The German environment agency proposes a medium value of 260 Euros per ton CO<sub>2</sub>eq.

With regard to the true cost an additional effort is needed: what is demanded is a comprehensive levy on every ton of greenhouse gases which, is to be increased step by step until 2030 if the intended steering effect requires it. Disadvantages in international competition can be prevented by a WTO-compatible Border Tax Adjustment.

True-cost pricing is the fundamental principle for all markets in order to reverse fateful trends in the climate questions successfully. A proven measure to internalise external costs: GHG levies coupled with complementary measures.

## The levy system

Levies that internalize external costs encourage efficiency in dealing with scarce goods. They optimise market forces and generate meaningful contributions to climate-compatible production and consumption structures. But even with a high levy supplementary measures are necessary. They have an effect where the market does not work properly: the principal agent problem, e.g. the landlord – tenant dilemma (the landlord decides, the tenant pays), non-monetary transaction costs (e.g. information deficits) or difficulties with border compensation (e.g., fuel tourism in border regions).

The most promising strategy is a division into sector transcending market instruments with a steering effect and sector-specific individual measures:

- If the signals for the reduction of GHG are mirrored in the prices, this results generally in the economically most favourable solutions. Hence levies are fundamentally the first priority.
- Non-market measures offer the possibility of reducing emissions in the case of market failure or slow adaptation processes.
- A pragmatic balancing between steering by price and steering directly facilitates reacting to sector-specific circumstances.

## The comprehensive climate levy

The current CO<sub>2</sub> levy on fuels is extended not only to motor fuels, but to all GHGs, including non-energy-related emissions. In addition, emissions from industrial processes and solvents as well as, where technically feasible, in agriculture, are taxed. Apart from fossil CO<sub>2</sub> the new levy extends to geogenic CO<sub>2</sub>, methane (CH<sub>4</sub>), nitrous oxide gases (N<sub>2</sub>O) fluoridated gases (HFC, PFC, SF<sub>6</sub>). To provide an incentive in the waste management sector the levy can be extended to feed stock emissions (in the materials of bound fossil carbon which is set free when burnt, e.g. in all sorts of synthetic materials). Ultimately an extension to all imported grey emissions (goods and services which have produced greenhouse gases abroad).

Moreover, three further changes to the current climate levy must be noted:

- A fixed increasing scale for levy rates (planning security).
- Only the part of the levy which exceeds external costs is refunded.
- The minimal CO<sub>2</sub> levy is adjusted so as to keep the price for heating oil in Switzerland at a minimum of 100 CHF per 100 litres. This guarantees a minimal effect during periods of low oil prices and enhances investment security.

## One price for all GHG emissions

Measure	elaboration, target values
Increase of CO <sub>2</sub> -levy on heating fuels	<p>The CO<sub>2</sub> levy on fuels which has been levied since 2008 is extended. Maximum levy level</p> <ul style="list-style-type: none"> <li>■ 2018: 120 CHF/t CO<sub>2</sub>eq, ca. 30 CHF per 100 litre of heating oil then annual increase of levy rate, doubling by</li> <li>■ 2030: 240 CHF/t CO<sub>2</sub>eq, ca. 60 CHF per 100 litres of heating oil.</li> </ul> <p>Depending on the price of crude the maximum levy level is adjusted to prevent the price from falling below a certain threshold (e.g. 100 CHF for 100 l of heating oil).</p>
Extension of CO <sub>2</sub> levy, Comprehensive GHG levy	<ul style="list-style-type: none"> <li>■ Levy on all GHG: traffic (adjustment to the forecourt prices in other countries), agriculture, fluoridated gases, geogenic CO<sub>2</sub>, non-energetic emissions, methane, nitrous oxides, etc.</li> <li>■ CO<sub>2</sub>-levy on feedstock emissions</li> <li>■ CO<sub>2</sub>-levy on all grey, imported emissions</li> </ul> <p>For each levy a border tax adjustment for both import and exports is established.</p>

# Switzerland's 10 climate levers

The climate-relevant, partly overlapping sectors have a nationwide, or even global frame of reference. Intervening here has a clear effect: these are the climate levers of Switzerland. In order to reach the global target of 'net-zero GHG emissions' the tonnages related to each lever must rapidly decrease, aiming for zero. What is strikingly effective are the cross-border levers: In terms of climate levers, Switzerland belongs to the G20, partly even to the G8.

## 1 Domestic emissions

Lever: 50 Mt CO<sub>2</sub>eq/a

The inventory consists of nationwide CO<sub>2</sub> from fossil energies as well as other GHGs like methane, laughing gas and fluorinated carbons. These emissions have declined only marginally over the last years; however, the Swiss government expects them to be 20 % lower by 2020. The Kyoto Protocol, the Paris Agreement and the CO<sub>2</sub> law set the framework. Beside the climate, energy and agricultural policy on a national level, the cantonal energy legislation and the municipal practice are decisive for reaching the targets.

## 2 International aviation (from Switzerland)

Lever: 10 Mt CO<sub>2</sub>eq/a (including water vapour and nitrous oxide at cruising altitude)

There is next to no regulation for the climate impact of aviation. The amount of kerosene tanked in Switzerland is increasing annually. The passenger numbers are rising even more: we fly roughly twice as much as our neighbours. Although the international aviation authority ICAO is endeavouring to set up global compensation rules and a minimal efficiency standard, only national measures can decrease the rapidly rising demand.

## 3 Grey GHG emissions (import)

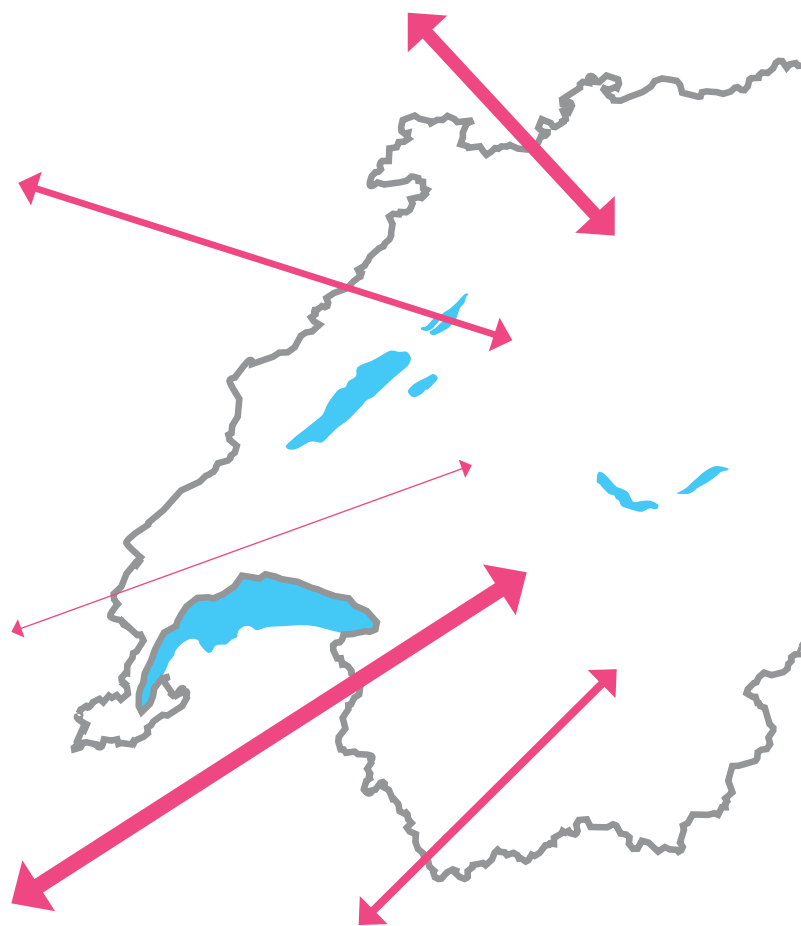
Lever: 110 Mt CO<sub>2</sub>eq/a

The majority of all the goods consumed in Switzerland are produced abroad. The CO<sub>2</sub>-heavy electricity import is number one, followed by petrochemical products. These grey emissions would tend to zero increase if a consistent transition to renewable energies was realised. In addition, a climate levy, optimised production processes, eco-design or a shared economy contribute to a reduction of grey emissions of consumer goods. So does an ecological public procurement system.

## 10 Climate protection abroad

Lever: 100 Mt CO<sub>2</sub>eq/a

Switzerland produces roughly 1% of the GDP of all industrialised countries. It should contribute to the implementation costs of the Paris Agreement to the same extent – annually about 1 billion CHF for emission reduction and adaptation costs. This means quadrupling the climate contributions using extra funds which are generated proportionally by polluters: existing instruments (e.g. auction/minimal price of emission certificates, partially earmarked CO<sub>2</sub> levy) and new means (e.g. flight ticket levy, financial transaction tax, import/consumption levy).



## 4 Grey GHG emissions (export)

Lever: 55 Mt CO<sub>2</sub>eq/a

Swiss industry is heavily dependent on export. The concomitant grey GHG emissions marginally exceed domestic emissions. Roughly two thirds of these exports are previously imported in a different form. Hence the reduction of grey import emissions contributes substantially to minimising export emissions. Likewise, diminishing domestic emissions by industry, commerce and services have an effect on reducing the grey GHG export.

## 9 International investment regulation and incentives

Lever: hard to quantify

Should investment shadow CO<sub>2</sub> costs be priced in for investment decisions in coal infrastructure be impeded or prevented? Should shadow CO<sub>2</sub> costs be priced in for investment decisions? Being on the board of development banks, the OECD, the International Aviation Organisation (ICAO) and elsewhere, Switzerland takes part in the decision process in such questions.

## 8 Direct investment

Lever: 270 Mt CO<sub>2</sub>eq/a

According to the Swiss National Bank direct investments with Swiss capital amounted to 1447 bn CHF, almost 40% of which are in the industrial sector. Often these are foreign engagements of Swiss companies or companies with their headquarters in Switzerland. Here more transparency and duty of care come into focus: they are to secure the sustainability of investments and reduce the climate footprint.

## 7 Portfolio investments

Lever: 230 Mt CO<sub>2</sub>eq/a

According to the Swiss National Bank Swiss capital in portfolio investments amounted to 1240 bn CHF in 2014. By divestment of assets which either cause high GHG emissions or are valued on the basis of fossil commodity reserves, the GHG intensity of the portfolios diminishes quickly, since the freed capital can transfer to the sectors renewable energies and resource efficiency. Environmentally savvy investors induce a halving of the GHG emissions hidden in portfolios.

## 6 Financial centre Switzerland

Lever: 1100 Mt CO<sub>2</sub>eq/a

The activities guided by the financial centre Switzerland cause 20 times the domestic emissions – or 2% of global emissions. Only five states emit more domestically. Although the buyers of these shares and other financial products are not solely responsible for these emissions it is their capital which 'works' in a climate-damaging manner.

## 5 Global company Switzerland: export goods

Lever: 12 Mt CO<sub>2</sub>eq/a (machines only)

Once they are put to use Swiss export products need energy (e.g. gas turbines, electric motors, looms) These goods are climate-compatible if they work efficiently and produce hardly any GHG emissions. Switzerland is to promote corresponding smart technologies – with ambitious climate legislation, an innovation-friendly environment and risk capital. Thus the climate footprint in the receiver country is reduced.



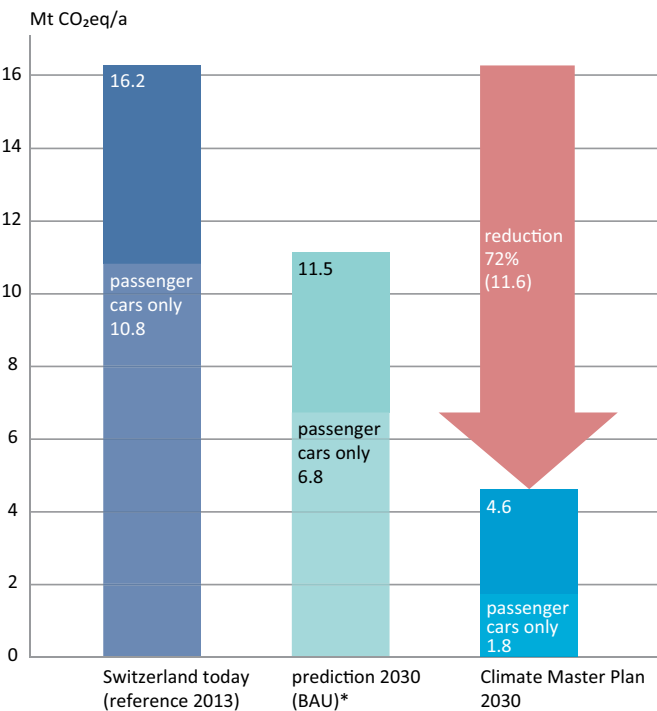
# Traffic – climate-aware on the road

Leverage: 11.63 Mt CO<sub>2</sub>eq/a by 2030

### Overview

Currently, traffic causes almost a third of domestic climate gas emissions (31.5 %) Two thirds of this is emitted by passenger cars (PC). Their share of the overall greenhouse gas inventory amounts to 21 %. The predictions for 2030 give a totally different picture, especially if Switzerland implements the Paris Agreement swiftly: **in comparison to 2013 the GHG emissions of the traffic sector shrink by 72 %, mainly those of passenger cars (– 86 %). The passenger car share of all traffic GHG declines by 40 %.**

### GHG traffic sector Switzerland



\* business as usual: continuation of measures already decided, maintaining current climate policy

### What is to be done

Given a reduction of GHG emissions by 83 %, passenger cars are the greatest climate lever in the traffic sector. In order to make this lever effective corrections of demand and supply for mobility services are necessary.

#### 2030: demand for transport services

In this sector the target is approximated by a performance-dependent traffic levy for passenger cars, levied on the basis of the type of car, in analogy to the levy on trucks. This levy also finances the traffic infrastructure, since the diminishing petrol and diesel consumption mean a diminution of the revenue from fuel duty. The mobility levy works:

- The passenger car percentage of the mobility in the entire passenger traffic declines by about 8 % (to 67 %) in favour of public transport as well as walking and cycling.

- Occupancy of passenger cars is raised by 12.5 % (mean level increases from 1.6 to 1.8 passengers per car); as a result, mileage will decrease by 11 % to 44.2 bn km (level of 1990s).
- Regardless of means of transport passenger kilometres are 15 % lower than today: thus the increase caused by population growth is compensated.
- **2030: provision of mobility services**
- Three quarters of new cars are electric. On average, in 2030 new cars sold emit 20 g CO<sub>2</sub>/km.
- Fossil-fuelled new cars can emit 60 – 80 g CO<sub>2</sub>/km. This corresponds to a fuel consumption of 2.3 – 3.4 l petrol or diesel (100 km). This is in the range of today's highly efficient upper middle class cars (3 l per 100 km).
- The average car already on the road will emit 90 g CO<sub>2</sub>/km. This corresponds to half of today's emissions.
- To ensure that the percentage is CO<sub>2</sub>-neutral, the additional electricity must be generated by renewable energies. (ca 4.5 TWh, see p. 15) Battery recycling reaches the 100 % mark and their production is based on climate-compatible energies.

### Key to GHG reduction in traffic

Measure	design, target values
Reduction of modal split for individual traffic	Priority: public transport, cycling/walking
import regulations for new cars	■ 60 g CO <sub>2</sub> /km by 2023 ■ 20 g CO <sub>2</sub> /km by 2030
■ for utility vehicles < 3.5 t (vans)	■ 110 g CO <sub>2</sub> /km by 2023 ■ 90 g CO <sub>2</sub> /km by 2030
■ for utility vehicles > 3.5 t (trucks)	introducing a new target value: 375 g CO <sub>2</sub> /km by 2030
commuter tax deductions	commuter tax deductions are abolished (misdirected steering tool for climate protection)
Compensation fuel imports	increase of compensation share on emissions: 20 % for domestic projects by 2030 (10 % by 2020)
proportion of renewable fuels	increase to 20 % by 2030 (like EU): ■ biofuels (diesel, ethanol), which meet high standards regarding environmental protection and social criteria ■ Renewably produced synthetic fuels (power-to-gas/liquid)
Performance-related traffic levy for passenger cars	Steering of traffic demand
More passengers per vehicle	stopping points for car-sharing agencies, privileged access to central areas
National electro mobility strategy	Achieving 50 % of all vehicle kilometres by 2030 (see box)
Stop fuelling across borders (adjusting fuel prices)	Extending CO <sub>2</sub> levy on motor fuels to adjust fuel prices to those in neighbour countries

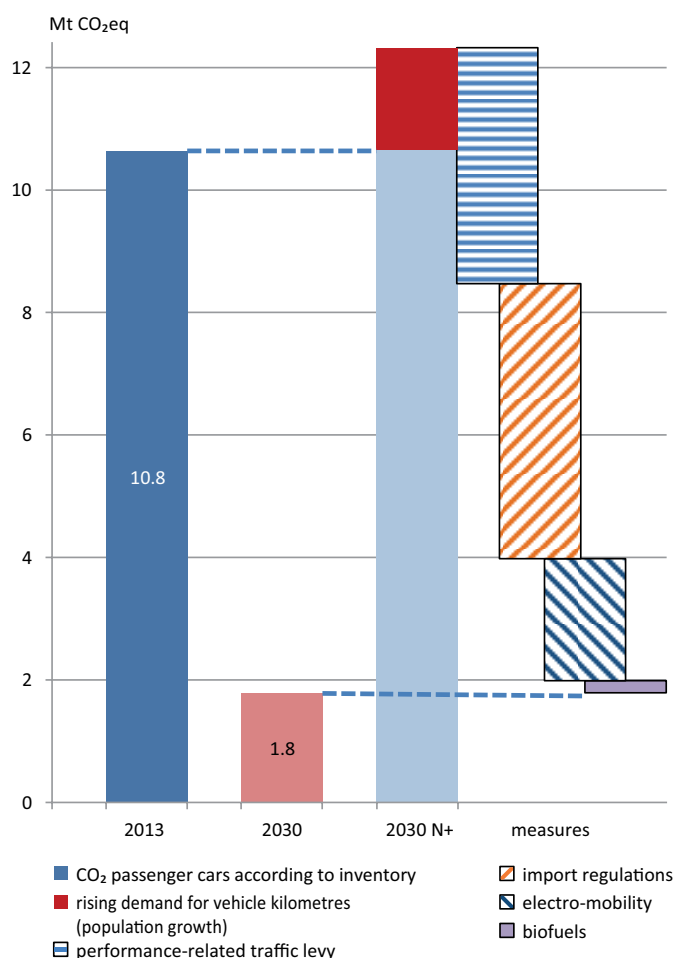


- To enable half of the vehicle kilometres to be electrically powered, a yearly increase in car replacements is necessary. Augmenting the general renewal rate to 9.5 % by 2025 is feasible without the economically and ecologically questionable early replacement of vehicles.

#### ■ Footnote: utility vehicles 2030

- Vans are up to 50% electric and average consumption of fossil-fuelled vans is 4.5 l Diesel (100km).
- New trucks emit 375 g CO<sub>2</sub>/km on average. They consume roughly 25 % less fuel than current top models, or half of today's average fleet. By 2030 the fossil-fuelled new utility vehicle fleet should have reached today's best practice (500 g CO<sub>2</sub>/km). To reach the target of 375 g, 25 % of vehicle kilometres must be emission-free (hydrogen and electric vehicles).

## CO<sub>2</sub> reduction passenger cars



### National electro mobility strategy

In Norway, as a result of tireless promotion, every fifth new car is electric. In addition to the PC import regulations an electro mobility strategy is paramount:

- Build a charging Infrastructure with comprehensive coverage
- Standardize charging processes
- Elimination of technical and other trade restrictions
- Interconnection of local and regional activities
- Securing the running of E-mobility with clean power by optimising energy efficiency and installing more renewable energy.

*By 2030 half of the vehicle kilometer are electrically powered!*

### Energetic wigggle room: city or municipality

#### Pricing in services

Municipal traffic measures are often connected with a steering aspect. Thus the provision of parking spaces and their pricing have a crucial influence on the choice of the means of transport; the same applies to a city toll.

#### Change the modal split in order to lower motorized individual traffic

The goal is to reduce the transport services requested by motorized individual traffic (MIT) in favour of public transport (PT) as well as walking and cycling. The majority of MIT is below three kilometres; hence local bicycle or pedestrian traffic play a key role.

Recommendations:

- Removal of misdirected incentives in the tax system (commuter tax deductions)
- Extension of a pedestrian- and bicycle-friendly infrastructure
- Support the transition to a car-free co-existence of living and working (e.g., at the level of planning)
- The whole range of municipal employees – from police officer to mayor – travel, if anyhow possible, by bicycle or on foot.

#### Promotion of car-sharing and efficient mobility

Parking spaces for car-sharing in the village. If car-sharing keeps gaining importance and if providers continue promoting electric cars, the nationwide target of 50% of the overall mileage being covered by electro mobility will become feasible since car-sharing vehicles perform above-average mileage and car-sharing fleets are replaced faster.

Municipal procurement is the model. Electric cars and other efficient vehicles are the business card of every municipality.

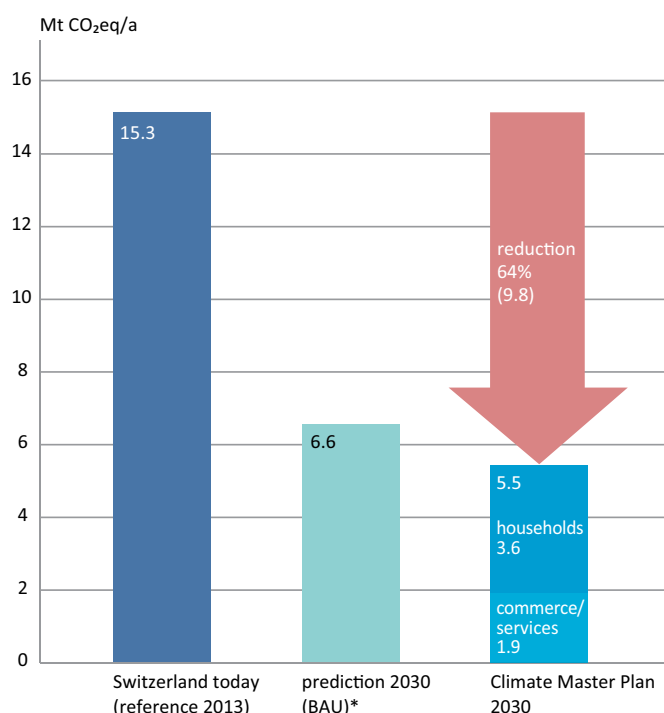
# Buildings – naturally warm

Leverage: 9.8 Mt CO<sub>2</sub>eq/a by 2030

## Overview

Currently buildings are responsible for about 30 % of domestic GHG emissions. It is almost exclusively CO<sub>2</sub> which arises from heating and hot water produced with fossil fuels. This will look radically different in 2030, especially if Switzerland implements the Paris Agreement swiftly.

## GHG buildings sector Switzerland



\* business as usual: continuation of measures already decided, maintaining current climate policy

## What is to be done

Compared to traffic the building sector has already started to reduce its GHG emissions. The basic incentive is an increasing CO<sub>2</sub> levy, supported by a building programme and tax-based retrofitting incentives.

However, the building sector is not straight on target either. More can be done. What is requested is a more profound change in demand and supply of heat. This can happen if the present instruments of promotion are strengthened and complemented by effective demands (on-target retrofitting guidelines, compulsory funds for energetic modernisation).

The adjacent table presents wide-ranging measures for supply and demand. These are the consequences:

### ■ 2030: the development of the demand for heat

- From 2020, the yearly retrofitting rates of old buildings will be doubled, reaching 2 % of the area of the year 2000. Additionally, the rates of building substitution will double to 0.3 % from 2020.
- As from 2020 90 % of new buildings will be realised as near zero energy buildings.

- Between 2020 and 2030 the hot water demand per person will continually diminish by 15 %.

- The area needed per capita stagnates at the level of the years 2006 – 2013 (58.6 m<sup>2</sup>/person). As a result of population growth the energy reference area of households will increase all nevertheless.

### ■ 2030: the development of energy supply

- Oil-fired heating systems have a yearly renewal rate of 6.7 %. Hence they are replaced within 15 years. In 80 % of the cases a low-CO<sub>2</sub> replacement is chosen. (biomass, heat pumps / environmental heat, solar heat, district heating). The additional electric power needed for the newly installed heat pumps (ca. 3.2 TWh) will be covered by renewable energies.
- Gas-fired heating system have a yearly renewal rate of 5 %, within 20 years they are all replaced. For 50 % the replacement is a low-CO<sub>2</sub> system (as with oil-fired heating systems).
- New houses do not use any fossil fuels for heating, cooling or cooking.

## Key to GHG-reduction in buildings

Measure	Elaboration, target values
MuKEN 2020	Follow-up to Recommendation for state energy legislation 2014, various measures.
Raising of CO <sub>2</sub> levy on heating fuel	(see p. 5)
Augmentation of buildings programme by central government	Raising CO <sub>2</sub> levy is to double the budget for retrofitting buildings to 400 million CHF.
Augmentation of buildings programmes of cantons	By increasing the CO <sub>2</sub> levy on heating fuel as well as by raising cantonal contributions to the financing of cantonal buildings programmes are to be doubled to 240 – 320 million CHF. Subsidy rates are to be increased.
Retrofitting standards for buildings in energy efficiency class F or G	By 2030 all buildings must conform to a minimal efficiency class E and/or present a timeline for renovation.
Heating systems with renewable energy	For new-builds or replacements heating systems with renewable energy are to be installed. (Exceptions for economically challenged landlords).
Modernising: provision for energetic home purchase as savings plan	Owners of inefficient properties are obliged to set up a fund for the energetic renovation of their buildings. The savings rate depends on the energy efficiency class of the building.
Competitive advertising for GHG-reducing programs and projects	For municipalities and other players
Flat-rate tax deductions for buildings maintenance only in case of energetic minimal standards	<ul style="list-style-type: none"> <li>■ As a rule, building maintenance can be deducted from taxable income. As from now the actual cost has to be documented if the building doesn't conform to minimal efficiency standards.</li> <li>■ If the Investment costs for reducing the energy consumption for heating and cooling can be tax deducted by splitting it to several fiscal periods, there is more incentive to have a comprehensive renovation rather than a piece work.</li> </ul>

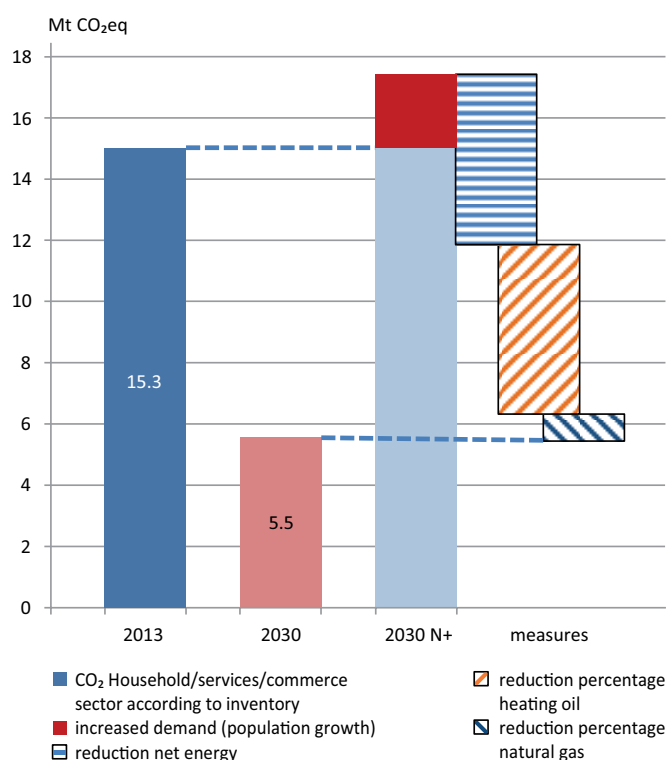
### ■ 2030: sector commerce/ services

The energy needs will develop analogously to the sector living, since primarily heating energy is required. The energetic footprint of commercial buildings also depends on new build quality, retrofitting rates and retrofitting depths.

*No more oil and gas for new-builds  
and replacements of heating systems!*



### CO<sub>2</sub> reductions in the buildings sector



### Wiggle room municipality

In the sector buildings municipalities play a paramount role: as owners of real estate, as judges of requests for planning permission or as agents in the energy supply. It behoves local authorities to set energy- and climate-political precedents which exceed regulatory norms. Climate- alliance cities and energy towns are doing this already.

- Procurement mechanisms must be climate-compatible.
- Municipalities initiate energy-efficient area and local planning which uses districtwide, renewable heat and cold supply solutions (esp. with locally owned utility); they implement these targets with mandatory owner-agreements.
- Municipalities implement the retrofitting of buildings and the installation of exclusively renewable heating systems in their own properties.
- They give away plots of land only if a climate-compatible use is proven (sale, lease-hold).
- They sensitise landlords with information and advice for the higher-level climate goals. They point out climate-relevant aspects and possible subsidies in case of implementation tasks (e.g. for planning permission process).

# Industry – intelligent and efficient

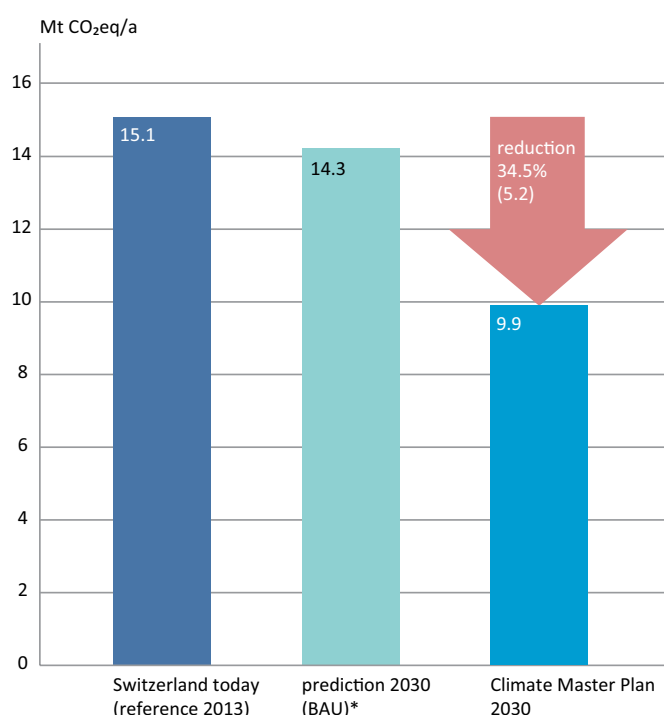
Leverage: 5.2 Mt CO<sub>2</sub>eq/a by 2030

## Overview

Currently the industry sector is responsible for 30 % of domestic GHG emissions. This includes public power and heat production, refineries as well as processes connected with waste (incineration, composting, landfill).

The prediction for 2030 looks radically different, esp. if Switzerland implements the Paris Agreement.

## GHG in industrial sector Switzerland



\* business as usual: continuation of measures already decided, maintaining current climate policy

## What is to be done

For disposal or destruction of various types of waste, emission reduction will – despite great efforts – remain a zero-sum game. The reason is the anticipated population growth and the concomitant increase in waste (in respect to waste per capita Switzerland is a sad European champion). Equally, in the sector of energy production processes the GHG reduction potential is modest (ca. 0.5 Mt CO<sub>2</sub>eq/a). Hence these two sectors are not elaborated here.

In contrast, the classical branches of industry are in great need of reduction: their contribution to the domestic GHG-burden (currently 9.4 Mt CO<sub>2</sub>eq/a) can be nearly halved by 2030. Special consideration must be given to processes (including solvents, reduction potential about 2 Mt CO<sub>2</sub>eq/a) as well as the use of energy (reduction potential almost 2.4 Mt CO<sub>2</sub>eq/a).

The consequences of the Paris Agreement are that every company – possibly supported by their industry association – devises a plan how it can reach the zero-emissions targets through naturally occurring re-investments. Whoever finds this too demanding today should increase their R&D efforts.

## Industrial use of energy

■ The most important tool is the CO<sub>2</sub>-levy with its concomitant levy relief option through agreement on targets. As a result of the further elaboration of levy exemption (by intensifying the CO<sub>2</sub>-law and MuKEn) the number of companies with a target agreement increases; so does the effect of the time-honoured tools. Suitable measures: Raising of CO<sub>2</sub>-levy as well as the economic viability criteria, lowering of the threshold for heat in the MuKEn large-scale consumer model (from 5 GWh to 1 – 2 GWh).

■ Emissions trading schemes (ETS) show less positive results than expected. They would have to stipulate a CO<sub>2</sub>-price as high as external costs. This demand is not met by ETSs today, that is why they do not result in additional lowering of emissions.

■ The cement industry is responsible for roughly 60 % of all energy-intensive industrial emissions. This share will be reduced by a third by the use of secondary fuels, and partial substitution of cement by alternative building techniques.

## Industrial processes

Here geogenic, not energy-related emissions of the cement industry (50 %) as well as the use of solvents and fluorocarbon hydrates (35 %) are mostly responsible for GHG emissions.

### ■ Solvents and fluorocarbon hydrates (FC)

■ The main focus lies on the avoidance of FC with great greenhouse potential as well as their re-use and competent disposal. Natural coolants like ammonia as well as the use of less climate-effective carbohydrates can replace FCs. Even if the latter were to be necessary at times (e.g. for reasons of safety or cost), the technical reduction potential is almost 100 %.

■ The EU considers in the draft for the new FC regulation a reduction of over 70 % by 2030 as a cost-effective scenario. In analogy, Switzerland has an economically feasible reduction potential of 80 % compared to today's FC-emissions.

## Key to GHG reduction in industry

Measure	Implementation, target values
Comprehensive GHG levy (see p. 5)	The strong climate effect of industrial non-energetic emissions is efficaciously lowered.
Phase-down with quota system for FC (like EU)	Quotas allocated to producers and importers of materials, preparations or products with FC decrease annually. This results in an 80 % emission reduction compared to 2010.
Alternative building techniques with less cement	Use of cement primarily for bridges and foundations, for high-building wood or other climate-compatible building materials are used.
Increase in non ETS sector (no levy)	The current system is continued, but additional RSEL incentives are integrated <ul style="list-style-type: none"> <li>■ Raising of CO<sub>2</sub>-levy</li> <li>■ Enhancement of criteria for economic viability</li> <li>■ Tightening of large industrial energy user article, levy-exemption only for the part of levy which exceeds external costs (e.g., 120 CHF/t).</li> </ul>





#### ■ Cement

- In cement production clinker can be partially replaced by other cement components. Since geogenic CO<sub>2</sub>-emission are produced when clinker is made, they would decline correspondingly.
- A reduction would be possible if Portland cement were to be replaced by so-called 'low-CO<sub>2</sub>-cements'. These have either a low clinker percentage or consist of new mineral binders which are produced with low CO<sub>2</sub>-emissions. Moreover, there are binders which are able to bind CO<sub>2</sub> from the air: for instance, lime mortar (only for specific uses).
- If the quantity of production declines, the geogenic CO<sub>2</sub> emissions from cement factories will decline as well: for instance, by using alternative building materials (e.g. wood) or by intensified building materials recycling.
- Within the framework of the National Research Programme NFP70 (energy transition) the project 'low-energy concrete' is being pursued. This may turn into a promotion programme for sustainable, low-concrete building.

*Being a climate pioneer =  
setting up a plan for net-zero-emission*

# Agriculture - bestially affecting the climate

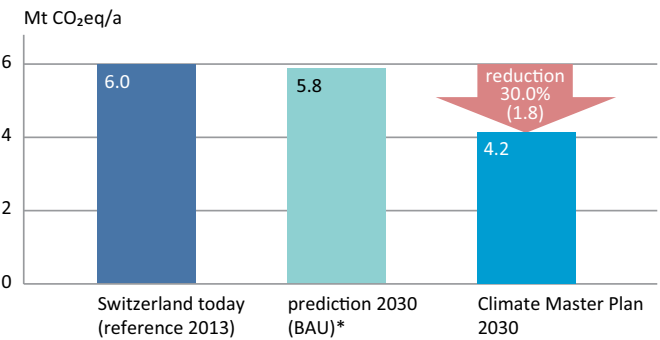
Leverage: 1.8 Mt CO<sub>2</sub>eq/a by 2030

*Priority for organic food  
and reduced consumption of animals.*

### Overview

Currently agriculture is responsible for 12 % of domestic GHG emissions. What is not included in this figure are the CO<sub>2</sub> emissions in connection with energy use. This is the prediction for 2030 according to our own calculations if Switzerland implements the Paris Agreement.

### GHG agriculture Switzerland



\* business as usual: continuation of measures already decided, maintaining current climate policy

### What is to be done

Conventional animal-intensive agriculture and the use of area connected with growing animal feed raise the GHG-emissions of the agricultural sector globally. Limiting these emission sources is an important goal of climate policy. To achieve this the greening of agriculture as well as the reduction of livestock numbers and the consumption of animal products come increasingly into focus. Reducing food waste is another important task.

### New directions for agriculture

By optimising the customary processes GHG-emissions can be reduced by 15 – 20%: e.g. with additives to animal feed, efficient management of the farm's indigenous manure and soil-sparing methods like direct sowing. However, to reach the emissions reductions of 60% and more by 2050, these optimising processes will not be sufficient. What is needed is a new direction for agriculture, turning away from animal-based intensive land use to an ecological, plant-based agriculture with local nutrient cycles. A reduction of livestock reduces not only the direct methane- and laughing gas-emissions, but also those caused by land use

### What about forestry?

Forestry provides important contributions to biodiversity, water ecology, erosion and population protection. In matters of climate the forest is a CO<sub>2</sub> sink, as the source of all alternative building materials and climate-neutral fuels. By increasing the area in the alps and an improved cascade-use, these factors can be expanded. Since emissions reductions are allotted to the respective sectors, quantifying is not needed here.

and deforestation, as well as planting, transport and processing animal feed; Per animal calorie roughly 10 plant calories must be produced, processed and fed. Moreover, as a result of less pressure on agricultural areas there is globally more space for climate-positive practices like reforestation, re-naturation of bogs and humus- accumulation by bio-coal. In order to reach a GHG-reduction of 30 % by 2030 livestock has to decline by about a quarter. Such a transformation only works with a concomitant change of consumption patterns swivelling towards a plant-based diet. Otherwise we run the risk that the domestic reduction of livestock is compensated by imports, with climate gas levels remaining the same or even increasing.

### Key to GHG-reduction in agriculture

Main measure	Elaboration, target values
Elaboration, target values	Initially as levy on domestic and imported meat and dairy products. Thus domestic and imported products get equal treatment, consumption and production patterns are changed simultaneously.
Collateral measures	
Reduction of climate effect of animal feed imports	All imported animal feeds must prove that they are not from rain forest areas, i.e. that they are not part of incentives for deforestation.
Area demand for keeping live stock	No more permits for keeping livestock without land. Livestock is generally connected with the need for animal feed and the area needed to grow it.
Adjustment Direct subsidy system	Elaboration of production system as well as resource efficiency contributions is increasingly focussed on climate-sparing practices.
Research: switch to climate-sparing agriculture	Promotion of transition programmes for farmers – including development of new point-based value generation chains and spreading production methods which make use of the soil as carbon sink.

### Grey GHG have a tremendous effect

If we include the emissions caused by growing import of food-stuffs and animal feed as well as the production of additives for livestock and crops, the amount of GHG emissions agriculture is responsible for rises considerably: according to a study carried out by the Research Institute for Organic Farming the increase amounts to a rise from 6 to 15 Mt CO<sub>2</sub>eq/a.

# Clean electricity

The leverage of this sector is already considered in the other sectors.

## Clean-electricity country Switzerland?

There are no electricity-producing major CO<sub>2</sub> emitters in Switzerland. But as a result of the export of hydroelectric power and the import of fossil-based electricity the rate of CO<sub>2</sub> per kWh is over 100 g CO<sub>2</sub>. Electricity imports are responsible for 13 Mt CO<sub>2</sub> emissions – varying from year to year.

Electricity generated by renewables like water, sun, geothermal energy or wind is far more climate-friendly. The production of wind energy, for instance, has a tenth of the climate impact (max. 10 g CO<sub>2</sub>/kWh) in comparison to imported electricity.

The GHG emissions connected with electricity production have already been included in the emissions calculations of traffic, buildings and industry; hence no more CO<sub>2</sub> tonnages have to be considered here. Moreover, the assumption that by 2030 our electricity needs will be supplied by renewables in Switzerland or abroad seems to be realistic. It is safe to assume that no gas-and-steam power plant (or even several) will be built in the medium or long term since they are most unlikely to be cost-effective.

### Footnote: 'dirty electricity tax'

It is a fact that our country produces by and large low-carbon electricity. Since clean hydroelectric power certificates are sold abroad and Swiss consumers are partly supplied with imports from coal and gas power plants, the so-called grey emissions of electricity imports amount to about 13 Mt CO<sub>2</sub> eq per year. By introducing a tax on non-renewable electricity (dirty electricity tax) importing electricity from fossil and nuclear plants would no longer make economic sense: just one centime per kWh reduces imports to practically zero. This measure will not lead to a shutting down of coal-fired power plants, but it will result in a markedly better CO<sub>2</sub>-balance for Switzerland; for Europe, however, this will not be the case (see chapter 'Grey GHG Emissions'). For this purpose, a new European electricity market design is needed. The proven instrument to approximate this goal is a grid charge, aiming at amortising the investments in renewable energies.

## Increasing applications for electricity – decreasing amount of CO<sub>2</sub>

Due to the mounting electrification of vehicle traffic and more intense use of environmental heat by heat pumps, the electricity needs will increase in these sectors (e-mobility 4.5 TWh/a, heat pumps 3.2 TWh/a). To be able to cover these additional needs with renewable energy, the well-known efficiency potential in households (replacement of electric heating systems and electric water tanks), commerce and industry must be fully tapped; in addition, more renewable energy must be produced at a faster pace. This is a major challenge for climate policy, since increased imports of CO<sub>2</sub>-heavy electricity from coal and gas plants are to be avoided. Incentives are created by an efficient GHG tax on electricity imports.



The chief goal is the breakthrough to a nuclear-free, 100 percent renewable electricity production by 2035 at the latest, and a corresponding electricity consumption mix.

The proven tool to approximate this objective is a grid surcharge to amortise the investments in renewable energies (feed-in tariffs). A substitution by other tools is possible when the European electricity market is adjusted correspondingly.

### Wiggle room municipality

Towns and municipalities play a model role for the population and the economy. Moreover, they are responsible for the municipality-owned energy generation plants as well as the implementation of state and federal regulations – e.g. as regards electricity efficiency. As the authorities in charge of granting planning permission they play an important role in adding more renewables (solar plants, wind parks); equally, by designing (local) planning conditions and application-friendly regulations they are in a key position. Last but not least they themselves – often as owners of their utility – can invest in renewable electricity generation, start new trends with landmark projects and act as regional pioneers.

*Dirty electricity in the grid:  
not necessary!*

# Grey GHG emissions – capture and stop

Leverage: nearly 30 Mt CO<sub>2</sub>eq/a

## To and fro

This fact is often overlooked: 70 % of the GHGs connected with the consumption of products and services in Switzerland are produced abroad. They are emitted in production processes abroad and the goods are then imported. It is patently obvious that these so-called grey emissions, when taken into consideration, increase the climate-harming GHG load of Switzerland. Just as in the import of goods there are also hidden grey emissions in export. Although this toing and froing does not facilitate charting Swiss GHG emissions, correct book-keeping is quintessential for a fair and successful climate policy. The main emphasis must lie on climate-harming sectors which have sufficient information as regards services and goods chains.

## Climate-focussed chances

Measures to reduce grey GHG emissions optimise the climate efficiency of the Swiss economy. They are effective because domestic production does not need to be set up from scratch.

- There are advantages for products which are climate-friendly throughout their life cycle.
- Eco-dumping is prevented; imported products are dealt with in the same manner as domestic products.
- The innovation potential is strengthened; thus the long-term competitiveness of Switzerland is guaranteed.

A CO<sub>2</sub> levy on grey emissions of steel production leads to products from old, inefficient plants being more expensive in comparison to recycled steel and the production in modern plants. At the same time, it creates an incentive to replace steel with materials which are less CO<sub>2</sub>-heavy. Due to the levy suppliers are changed or products adjusted.

Ultimately the suppliers with the best production processes win. In the electricity sector for example renewable power will be leading the field. Technologies which reduce the consumption of GHG intensive raw materials will increase their market share.

## Measures of first priority

First and foremost, the high-impact measures, where grey GHG emissions can be determined easily, or where there is a general consensus, must be implemented.

### Electricity

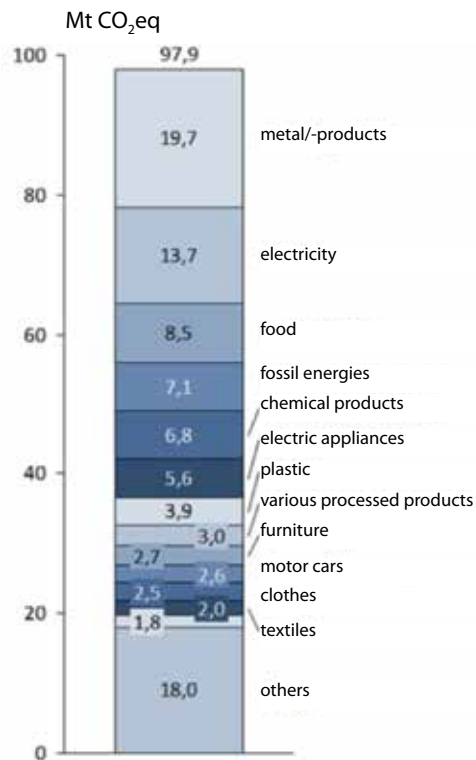
The grey emissions stemming from electricity are relevant (see graphics). The certificate of origin constitutes a tallying system. Since the current certificate does not factor in the point in time of production, a real-time certificate has to be introduced. This is a way of preventing the greenwash of coal or nuclear electricity.

### Wood, soya, palm oil and others

The clearing of rain forests has to be stopped, it causes enormous local damage. As a result, the associated GHG emissions would diminish to near zero. The 'Timber Regulation' and sustainability standards for palm oil and soya are the existing base for climate-compatible action.

## Imported goods – grey GHG emissions

Year 2011 excluding import of services (11.7 Mt CO<sub>2</sub>eq)



## Having a close look

Small, rich countries like Switzerland generally have a high share of grey GHG emissions. Currently our climate policy only takes GHG emissions 'made in Switzerland' into account. In 2011 our consumption-generated GHG emissions amounted to 13.6 t CO<sub>2</sub> per capita per annum, almost 70% of which originate from abroad: namely from importing coal-generated electricity, metals, foodstuffs or wood from the tropical rain forest. Not taking grey emissions into account results in economic disadvantages. In an increasingly globalised world companies can sidestep climate-protection measures by outsourcing GHG-intensive processes to countries with a weak regulatory framework. The energy-intensive steel industry, for instance, can be moved abroad. Ambitious climate measures in the production sector are thus bypassed.

As opposed to domestic Swiss GHG emissions, the comprehensive, correct calculation of the consumer-generated emissions is very demanding. A declaration must be credible, it can be guaranteed by a label or a certificate of origin. While for domestic emissions often knowing the energy consumption suffices, determining grey emissions necessitates a climate gas inventory of the relevant production steps abroad.



*Grey future? No!  
Circular & Share economy? Yes!*



#### ■ Procurement, labels and standards

State procurement based on labels and standards strengthen the consideration of grey GHG emissions. Additional criteria comprising environmental and climate questions are admissible both under WTO and EU law. The authorities become the trendsetter.

#### ■ Using existing agencies

Many companies keep an account of their grey GHG emissions. An emissions reduction is taken into account for measures within the framework of the Energy Agency of Industry (EnAW), the Cleantech Agency (act) or the Foundation for Climate Protection and CO<sub>2</sub> Compensation (Klik).

#### Political measures

In order to implement the necessary measures a legal base in CO<sub>2</sub> legislation is desirable. But many tools can be implemented by other laws as well on the state and municipal level. An overview:

- Promotion of labels and standards.
- Support of circular economy, advancement of resource-efficiency and recycling.
- Improvement of framework for increasingly consuming only strictly necessary services and goods (share economy) – motto 'sharing rather than owning'.
- Programmes for research and development of products with low grey emissions.
- Considering of embodied emissions in new efficiency and emission standards for appliances, vehicles, and buildings.
- Introduction of standards for GHG-heavy product groups (e.g. rain forest).
- Consumption tax on grey emissions – gradual capturing, commencing with electricity (dirty electricity tax, connection with real-time certification) and highly GHG-heavy products (e.g. cement, steel).
- Agreement with importers and product suppliers which provides target values for GHG emission reduction in the value added chain.
- Guarantee: free trade agreements must not restrict measures to reduce GHG emissions stemming from consumption, they have

to acknowledge that not taking into account external environmental costs is dumping.

It will take time for the pricing in of grey GHG costs to be accepted. Hence accompanying measures which promote the sale of products with low grey GHG emissions is as important as programmes for quality control of GHG reporting.

#### Estimated effect: half the battle

Due to improved production processes in Switzerland, with eco-design, circular economy and social changes like share economy, the amount of imported goods can be halved. There is great potential in the consistent reduction of climate emissions of the producers abroad, for instance by switching to renewables. This can be achieved by consistent management of supply chains (best-in-class approach). Ultimately grey emissions are reduced if the consumer preferences change in a climate-relevant manner.

The objective is to halve all grey greenhouse gases by 2030 in order to reach net-zero-emission by 2050.

#### Climate effect of export products abroad

Many Swiss export product consume energy when in operation. (e.g. gas turbines, electric engines, looms). These products are climate-compatible if they function efficiently, and without GHG emissions. In this manner Switzerland remains at the cutting edge of innovation and contributes to the reduction of other countries' climate footprint.

For some export products the potential GHG reductions have been calculated. A study commissioned by Swissmem and the Swiss Environmental Agency concludes that just operating the exported machines has a savings potential of 12 Mt CO<sub>2</sub>, primarily by eco-design and energy efficiency. Possibly these operational savings are predicated on slightly higher GHG emissions in the production process – for instance, because the driving motor needs an additional speed control. They are to be taken into account within the framework of the new climate legislation. Ambitious climate regulation, the measures of the Cleantech masterplan, an innovation-friendly environment and sufficient venture capital are further keys for a successful, climate-compatible development of the export nation Switzerland.

# Aviation (from Switzerland) – no take off without a levy

Leverage: 10 Mt CO<sub>2</sub>eq/a (including water vapour and nitrous oxide at cruising altitude)

## Overshot

By 2030 aviation will be the most important climate-harming sector. The largely tax-free aviation is in great need of regulation. As yet there are no climate-compatible technologies within the aviation sector. The future route will include bearing the total cost of harming the climate. In addition, system optimisation and temporary surrogate measures involving climate projects outside aviation will be needed.

## Healthy growth control

Implementing the polluter-pays principle in the aviation sector is the absolute priority. Only by integrating external costs can the over-consumption of flyer miles be curtailed and the development of climate-compatible systems accelerated.

In the short term flight route management is effective. This saves 12 % of emissions and is economically advantageous. Another way of achieving immediate results is the reduction of flight demand, for instance by big companies adjusting their internal guidelines for air travel. A further option is increasing ticket prices: a hike of 10 % would lower demand by 3 %. Equally, mandatory compensation for flights can be introduced swiftly in view of the many extant certificates, and this can result in net zero emissions at least on paper.

Effective long-term measures are the extension of rail travel instead of short-distance flights, better efficiency standards (aeroplanes are in service for about 30 years), as well as the introduction of alternative fuels and engines.

Unfortunately, the climate effect of Swiss air travel is most likely to rise to more than 10 Mt CO<sub>2</sub>eq by 2020. An ensuing reduction to 6 Mt CO<sub>2</sub>eq by 2030 is demanding, but possible. The remaining emissions will be compensated by climate protection projects.

## Taking measures nationally and internationally

A successful implementation of the Paris Agreement, the limitation of global warming, means swift international regulation and climate-compatible taxation of the aviation sector (fuels i.a.). Political measures, with national elbow room, are listed in the adjacent table.

Beside a lowering and medium-term climate-friendly organisation of the supply of air travel, reducing demand is also an issue. Here additional measures, which are partly outside the aviation sector, are effective: creating more attractive rail travel, greater acceptance of video-conferencing and passing on as well as pricing in external costs of aviation (health and safety aspects).

## Boom & Problem

**Image.** It is not by chance that so far there are no effective climate protection tools: flying is one of the primordial dreams of humanity, wanderlust grips us. Equally, the globalised economy is based on business trips and air freight. The benefits are hyped, the costs are repressed.

**Quantity.** Aviation is experiencing a high growth-rate. The efficiency of aeroplanes is not increasing to the same extent. Therefore, CO<sub>2</sub> emissions from aviation are rising. Flights from Switzerland are currently responsible for 4.7 Mt CO<sub>2</sub> annually. In addition, there is the considerable impact of nitrous oxide and water vapour at cruising altitude, which doubles the CO<sub>2</sub> effect. For Switzerland this results in climate effects of almost 10 Mt CO<sub>2</sub>eq per year. Globally aviation contributes 5 % to overall climate forcing, for Switzerland it amounts to 16 % - and rising. Compared with neighbouring countries we fly twice as much.

**Price.** Flying has become much cheaper in the last few years, especially when compared to other means of transport. Reasons:

- Aviation does not bear the environmental cost itself, infrastructure and operational costs only partly.
- It benefits from a tax-free status (fuel) and planning privileges, e.g. for shopping malls and conference centres in airports).
- Owing to profits from airport secondary businesses (see above) airport fees remain low and demand abnormally high.
- The state guarantees connections to airports by public and individual transport and finances it, which is a negation of the user-pays principle.
- World-wide mobility causes billions of health costs (e.g., as entrance for pandemics), which the aviation sector does not have to bear.

**Technology.** As long as planes emit water vapor in high altitude this contributes to significant climate forcing. Therefore, planes that burn (partly) hydrogen are never climate neutral. The only way to achieve this would be to condense the vapor already on board.

**A sham solution.** Since kerosene is a major part of the flight costs, airlines and aeroplane manufacturers are trying to reduce consumption. So far this has been possible by increasing plane size, with a corresponding reduction of fuel consumption per seat. Beside this trend, the EU extended its emissions trading system to aviation in 2011; however, as it came under pressure from various countries, this was limited to European air space. None of these measures could prevent the constant rise of GHG emissions by the aviation sector.



### Urgent political action in the aviation sector

Measure	Effect (GHG reduction)	Regulator
the highest fuel efficiency standards for large-aircraft (i.a. fuel consumption)	long-term, several percent	ICAO (Sept. 2016) or Swiss federal government
European or global emissions trading system (ideally 100% compensation of CO <sub>2</sub> and other GHGs)	up to 100%	<ul style="list-style-type: none"> <li>■ ICAO or EU/Switzerland, or Switzerland unilaterally</li> <li>■ minimal standards for climate protection projects and bio-fuel, floor price for certificates (at least level of external costs)</li> </ul>
optimal flight planning (no holding patterns)	optimal, up to 12%	EU and bilaterally
research and development of climate-compatible engines	very long-term, 100%	<ul style="list-style-type: none"> <li>■ technology offensive in aviation, law financed by fuel duty (domestic flights) and flight ticket tax</li> <li>■ Switzerland can act autonomously</li> </ul>
extension of attractive alternatives to short-distance flights	long-term, several percent	financial contributions to setting up railway infrastructure abroad if long-distance connections from Switzerland are improved
limitation of flight options by night curfew (10pm to 8am), stop the extension of airports and the many privileges in planning	20% less than growth scenario	<ul style="list-style-type: none"> <li>■ aviation law, plan for aviation infrastructure (SIL, central government, cantons)</li> <li>■ Switzerland can act autonomously</li> </ul>
climate flight ticket tax, distinguishing short-medium- and long-distance flights	short-term, 5–10% (depending on tax level)	<ul style="list-style-type: none"> <li>■ aviation law, constitution (depending on the use of finances)</li> <li>■ Switzerland can act autonomously</li> </ul>
value-added tax on flight tickets	short-term, 3%	<ul style="list-style-type: none"> <li>■ VAT legislation</li> <li>■ Switzerland can act autonomously</li> </ul>
auctioning take-off and landing rights	prevents increase in capacity	<ul style="list-style-type: none"> <li>■ aviation law</li> <li>■ Switzerland can act autonomously</li> </ul>
emissions declaration for passenger flights and air freight	small	Switzerland can act autonomously

GHG emission from the aviation sector need to get a price as in all other sectors and emissions need to be fully compensated by climate projects.

*On the best route  
escaping the glass house*



# Financial centre Switzerland – conscientious instead of risk-laden

Leverage: within few years several 100 Mt CO<sub>2</sub>eq/a

## The greatest danger ...

... for our climate is our money! Pension schemes, insurance contributions, deposits and assets work against all endeavours to protect the climate. Our pension scheme money has been invested in companies emitting as much climate gases as Switzerland produces annually. This harms the climate and the financial centre Switzerland in equal measure: the implementation of the climate policy agreed in Paris will result in a drastic reduction of value because a large part of fossil energy must never be used.

## Money versus climate

In 2006 the former chief economist of the World Bank, Nicolas Stern, caused quite a stir with his report: climate change would be stopped if the world invested 1 % of GDP for this purpose. Today Stern assumes 2 % would be needed. And soon it will be more expensive because instead of withdrawing money from the fossil industry, gigantic sums are still being poured into it. Just in 2012 the 20 biggest energy companies have invested 674 billion USD in the exploration of new reserves. Notably with generous support from Swiss investors.

Companies which are based on processing and using fossil fuels also lay claim to substantial amounts of capital in Switzerland. The overall investment made in the Swiss financial centre causes estimated GHG emissions of 1100 Mt CO<sub>2</sub>eq – 22 times the Swiss GHG load.

In addition, portfolio and direct investments from corporate bodies or natural persons are responsible for about 500 Mt CO<sub>2</sub>eq annually.

## Consequences of (in)ability

With assets of 566'000 CHF per capita, Switzerland is the richest country in the world. Swiss citizens have entrusted the gigantic sum of about 1500 billion CHF to insurances and pension schemes. In addition, privately invested Swiss as well as foreign capital is administered in the Swiss financial centre.

With investments in the global financial centres the Swiss financial centre supports a scenario of global warming between 4 – 6 centigrade Celsius. Neither politicians nor the stakeholders in the financial market share a strategy to change this.

## When bubbles burst

We know from bitter experience that financial bubbles are dangerous, whether they form as a result of bad loans or fossil energy. The Swiss financial centre is exposed to considerable risk.

The climate goals can only be reached if the major part of the reserves of fossil fuels is not exploited. Precisely on these reserves are the balance sheets of global companies like Exxon Mobile, Chevron, BP or Gazprom. If they are not allowed to use the fossil reserves their capital shrinks dramatically. Many energy companies are greatly overvalued if you bear the global climate goals in mind. We are talking about the Carbon Bubble. Financial analysts issue stern warnings.

In a risk assessment from 2012 the global bank HSBC assumes that companies active in the fossil fuel economy will have to face a decline in valuation of 50 % and more if the unusable reserves





are not deleted from their books. Compared with current valuations, investors in the Swiss financial centre would have to suffer losses from 40 to 100 %.

Every dollar invested in oil, gas and coal increases the bubble – and the climate problem. If governments implement the Paris Agreement share prices of energy companies will have a great fall. Hence it makes economic sense to dump securities of the oil, gas and coal industry.

The Swiss financial centre plays a leading role, it disposes of a strong climate lever, it has to set an example.

*In the Swiss financial centre no more money is to be invested in companies which explore, process, deal in or sell oil, gas or coal.*

### **Clear demands, smart measures**

#### ■ **Expanding asset management goals by law**

Safety, yield, liquidity (art. 71 Swiss Pension Scheme Law): the three classical goals of asset management are to include the additional dimension of climate compatibility.

#### ■ **Creating transparency**

Pension schemes, insurance companies, banks, asset managers and stock exchanges are obligated to report regularly about the climate effect of their investments. Transparency can be achieved with relatively little effort.

As yet the contribution to climate warming in investments of institutional investors is not visible for clients. By way of risk analysis it is to be ensured that systematic overvaluations of companies with a high climate risk is taken notice of and corrected.

A glance at our neighbours: in Germany and other EU countries, pension schemes have to disclose to what extent ecological and ethical aspects are considered in their investment strategy. The French government has made climate transparency mandatory for all institutional investors, created a transparency label and determined which elements must be part of the report.

#### ■ **Objectives for investors**

The Swiss central government determines core parameters and reduction targets. The climate effects of investments are to diminish gradually. State-owned pension schemes like Publica and the State Pension Fund are the trail blazers.

Thus the investment risk caused by the Carbon Bubble is reduced. Investors are given sufficient time to divest themselves of climate-harming securities at a propitious moment.

A yardstick for risk reduction: by relying on indices which represent a climate gas-reduced world (e.g., MSCI Low Carbon Index, 67 t CO<sub>2</sub>eq per million invested CHF), the GHG effect of Swiss equity funds can be reduced by two thirds – while maintaining the return on capital!

#### ■ **CO<sub>2</sub> levy on climate-harming capital gains**

The Swiss financial centre introduces a levy on return on investment in climate-harming financial products. The cost of climate warming becomes visible in the financial markets; the capital flows are directed towards climate-compatible alternatives. Today investors earn money with their investments without paying for

the complete social damage of their activities. This is passed on to future generations and the victims of climate change. If external costs were reflected in the investment decisions, they would be different. The funds resulting from the CO<sub>2</sub> levy are to be used for climate projects, which would lead to climate neutrality of investments.

#### ■ **Engagement against climate-harming investments**

Switzerland does not provide export risk guarantees and declines international cooperation projects which promote the extraction of fossil fuels and the emission of climate gases. It advocates transparent, climate-friendly investment policy in OECD, UN, World Bank, G20 and other bodies.

Thus Switzerland is to lobby for a fundamental consideration of environmental aspects in the regulation of financial markets, for instance the framework of the Basel processes. A coordinated international procedure makes sense since financial markets act globally: by a coordinated raising of standards capital flight from climate-focussed markets can be prevented.

#### ■ **Reduction of climate-harming direct investments by companies listed on the Swiss Stock Exchange**

When carrying out their risk screening of investments, Swiss companies must price in as shadow tax a CO<sub>2</sub> levy on investments which emit more than 10'000 t CO<sub>2</sub>eq. annually.

Shadow tax means taking into account a global CO<sub>2</sub> levy in economic viability calculations even if this is not (yet) current practice. If the investment proposal turns out to be uneconomic under these circumstances, it will not be financed.

*Disinvestment before the Carbon Bubble bursts ...*

# Climate protection abroad – participating fairly

Leverage: 100 Mt CO<sub>2</sub>eq/a minimum

## The main polluters' duty

The goal of the Paris Agreement to limit global warming to 1.5° is only feasible if emissions in all countries are reduced. Moreover, even in a world with a temperature rise of 1.5° protective measures are necessary. The UN Climate Convention and the Paris Agreement postulate a contribution of the industrialised world to mitigation and adaptation measures in the poorest countries: as from 2020 at least 100bn USD annually. Switzerland has agreed to this and therefore has an obligation to contribute its fair share, being one of the most affluent and emission-intensive countries.

According to the polluter-pays and the precautionary principles, Switzerland's fair share of the costs of climate projects abroad is in the range of 1bn USD a year. This contribution is, on the one hand, to finance adaptation measures for the protection of particularly vulnerable communities; on the other it should result in a net emissions reduction of at least 100 Mt CO<sub>2</sub>eq.

Switzerland can fulfil its international obligations through established tools of the Climate Convention. The funds for these measures must be added to the existing Swiss development aid, they must not be compensated within the global credit line of that aid. What is called for are new financial tools based on the polluter-pays principle. Urgently!

## Focus climate finance

The Paris Agreement demands support for the following sectors:

- **Mitigation.** Reduction of current, and especially avoidance of new emissions are preconditions for limiting climate warming to a manageable degree. This can only be achieved if developing and emerging countries consistently use renewable and efficient energy systems.
- **Adaptation.** Certain effects of climate change can no longer be avoided, with grave consequences for humans, economy and environment – esp. in the poorest countries. Adaptive measures to the changing circumstances are increasingly needed for mere survival.
- **Loss & Damage.** In specially stricken regions adaptation measures will not suffice to protect the population and to ensure its means of subsistence. Various island states cannot defend themselves against rising sea levels in the long term. To be able set up new livelihoods these populations have a right to emergency aid – including territorial alternatives.

## International ...

To achieve the global energy transition the world community is asked to divert private investment flows of trillions of dollars into sustainable energy systems and infrastructure (mitigation). This transformation can only be accomplished by targeted incentives. The necessary public funds for this are estimated to be several hundred billion USD per annum.

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on). This transformation can only be accomplished by targeted incentives. The necessary public funds for this are estimated to be several hundred billion USD per annum.

## ... and the Swiss contribution

According to the Swiss federal government the sum total of expenses for international climate protection amounts to 250–300 M CHF. But this sum consists mainly of 'climate-relevant activities' of regular development projects. In fact, a mere 100 M CHF is paid for the designated climate financing tools. But even these contributions were financed from the Department for International Cooperation budget – at the expense of poverty mitigation.

Thus Switzerland is far from achieving the goal of appropriate climate finance. A just assessment of the Swiss contribution must result from the overall GHG responsibility of our country (including grey emissions, aviation and climate consequences of the activities of the financial centre) as well as our economic performance: the amount of 1 bn CHF per annum corresponds roughly to the share of the Swiss economic performance of about 1% GDP of all industrialised countries.

## The triple burden for developing countries

Industrialised countries have achieved their wealth with fossil energy, they are responsible for about 80% of GHG emissions. But it is primarily the poorest in developing countries who suffer the negative effects, although they have contributed comparative little to global warming. Typhoon damage, long droughts and different rainfall patterns, salinization of drinking water reserves near the coastal regions as a result of rising sea levels are tell-tale signs of incipient climate change.

Developing countries are facing a triple burden: in addition to the task to create welfare with limited means and combat extreme poverty climate warming implies two more tasks. First, they must protect their population and infrastructure against climate change. Second, they are expected to plan and implement future energy and infrastructure in a strictly climate-compatible manner, but often they possess neither the know-how nor the means to do so. Following the polluter-pays principle, the Paris Agreement obligates the wealthy industrialised nations to make substantial contributions.

Grey emissions as well as emissions from plane trips and activities of the financial centre: Switzerland is responsible for GHG emissions which exceed domestic emissions by far. To live up to its responsibilities it must inevitably contribute to climate protection measures in developing countries. Since Switzerland is relatively vulnerable to climate consequences it is in its very own interest to be deeply involved in restricting global emissions.

In Paris industrialised countries have pledged 100 bn USD per annum, an important but insufficient contribution to the climate finance needs of developing countries. In order to achieve the goal of limiting global warming at 1.5° or maximum 2°, private investment in the trillions have to be mobilised or diverted.

### Instruments in the climate orchestra

For the financing of mitigation and adaptation measures in less developed countries, various instruments have been created in the past two decades. The Paris Agreement lists five multilateral funds as chief instruments for international climate financing. The Green Climate Fund (GCF), the Global Environmental Facility (GEF), the Least Developed Countries Fund (LDCF), the Special Climate Change Fund (SCCF) and the Adaptation Fund (AF). These funds render it possible to group international climate financing contributions and to achieve effective results. Through taxes on climate-harming activities the necessary means can be generated according to the polluter-pays principle.

By 2020 the offset mechanisms of the Kyoto Protocol are available for emission reduction abroad, the Clean Development Mechanism (CDM) and Joint Implementation (JI). Both instruments are compromised in terms of integrity: partly on account of a questionable climate effect, negative ecological consequences and human rights violations.

Currently new tools are being developed which are to enable far-ranging reductions. They comprise entire sectors, technologies or regions, others are of a political nature. Measures defined by developing countries as well as mechanisms for a cooperative exchange of successful reductions are part and parcel of this; moreover, by linking national emission trading systems all this can be achieved at lower cost. But it is obvious that trade systems need appropriate reduction targets. If this is connected with a free

allocation of emission rights then the effectiveness of this tool is doubtful.

### Quality criteria – a quintessential component

As yet the performance of international mechanisms is middling, further developments are uncertain. The social and ecological integrity of climate protection measures abroad is a challenge: quality control is called for.

With mitigation projects an effective climate protection must be ensured; additionally, it has to be guaranteed that this environmental project would not have been realised anyway. Equally, an emission reduction scheme must not be credited to various parties, and it must not have negative social or ecological effects. In many places JI certificates are no longer accepted. CDM regulates environmental credits by positive and negative lists. These assess the kind of reduction and recognise only projects in the least developed countries. With additional quality criteria – e.g. the Gold Standards created by NGOs – the appropriate inclusion of local stakeholders is achieved, on top of a contribution to local sustainable development.

In order to swiftly become climate-politically operative Switzerland should not count on vague new mechanisms, but engage in a target-orientated, long-term fashion with existing tools. Moreover, there is the possibility to realise bilateral programmes and projects in host countries. Those will in turn have to strengthen their reduction targets.

Switzerland can make a paramount contribution to people in the least developed countries with political will and appropriate investments in both international climate protection and sustainable development.

### Climate projects as opportunity

Apart from the polluter-pays principle and global effects there are egocentric reasons to support developing countries in their struggle with climate change. International climate change is also an opportunity for Switzerland:

- **Knowledge and technology transfer.** Measures abroad open up a more climate-friendly development path. Switzerland can position itself as a cleantech hub in this economic field of the future.
- **Precaution.** The less climate gases are emitted in developing countries, the more time there is for everybody – also the industrialised countries – for the necessary transition to renewable, sustainable technologies.
- **Risk minimising.** Climate measures abroad preserve the progress achieved within the framework of the Swiss Development Cooperation Agency and private collaboration - and increase investment safety. They reduce new, climate-induced poverty and the accompanying consequences like lack of food, water and resource, the spread of infectious disease, social and economic destabilisation and climate-induced migration.





■ **Damage limitation.** There will be more and more consequences of climate change. Demands of the people affected for substitution and compensation from the perpetrators will increase in importance (loss & damage). Means invested in good time, on the other hand, have a social, ecological and economic yield.

### Development cooperation or climate financing?

Reducing **existing** poverty is the goal of development cooperation. OECD countries have pledged on various occasions to provide 0.7 % of their GDP for measures in the sectors health, education, equal rights, nutrition and good governance.

In the case of climate protection measures, however, global warming is the challenge: international climate finance should ensure, on the one hand, that future energy systems and infrastructures can be realised in a climate-neutral fashion also in developing countries; on the other hand, **additional** poverty caused by climate change should be averted. The Paris Agreement obligates the responsible wealthy, industrialised nations to support the most vulnerable countries in doing so.

Climate projects contribute to managing the additional challenges of climate change and to stabilise the situation of developing countries. This in itself does not diminish existing poverty. Both are needed. Nonetheless it makes sense to combine poverty reduction and climate protection:

- Consistent 'mainstreaming' of climate-relevant aspects in all development programmes creates synergies. A case in point is the promotion of drought-resistant rather than traditional varieties within the framework of agricultural projects.
- In many sectors the traditional projects of the Swiss Development Cooperation Agency are to be supplemented by climate protection measures (e.g. flood defences, coastal dykes, bigger rain water reservoirs).
- Giving the population access to sustainable energy makes the necessity of additional financing most obvious – at least as long as renewable energy systems are more expensive.
- Climate projects are to be measured by stringent sustainability criteria. They must not trigger new (poverty) problems from a socio-economic and environmental point of view.

Climate protection cannot replace poverty reduction – and vice versa. To guarantee the continuous progress of development cooperation and to protect it from the consequences of climate warming, both strands need sufficient funds.





### Means acquisition – also a political question

The realisation of urgent climate measures in developing countries depends on the swift provision of sufficient funds – also on the part of Switzerland. There is no shortage of ideas for feasible financing resources or fair instruments. First and foremost a constitutional base is needed.

Fundamentals for providing resources for climate protection abroad:

■ **Public contributions.** Public contributions and a favourable framework are the base for raising the necessary private investment. For major adaptation measures like coast and flood protection or resettlement, state contributions are indispensable since there are no incentives for private investors.

■ **Additional capital.** Climate protection is not development aid; the issue is the global public good 'climate'. Primarily it deals with preventing and combatting climate consequences – also in Switzerland's own interest. Climate protection and adaptation measures must not be financed from the Swiss Development Cooperation Agency budget.

■ **Polluter-pays principle.** Climate funds must be acquired primarily according to the polluter-pays principle to avoid a general unspecific increase of the tax burden. A smart design of the financing tools simultaneously has a steering effect.

*CH contribution:  
1% of global financial need, hence 1bn CHF/a*

### Sources for climate finance

Measure	Effect (CHF)	Regulation	Comment
earmarked CO <sub>2</sub> or GHG tax	preferably according to polluter – pays principle on all GHGs (ca. 20 CHF/t CO <sub>2</sub> eq): 1 bn CHF/a	CO <sub>2</sub> law, constitution	The current constitutional base does not allow earmarking of levies and taxes for climate finance.
consumption tax on grey GHG emissions	depending on the tax rate up to 1 bn CHF/a	CO <sub>2</sub> law	(see chapter 'Grey emissions')
auctioning all emission rights, introducing a minimal	floor price of 25 CHF/t CO <sub>2</sub> eq: currently 125 M CHF/a	Existing instrument in CO <sub>2</sub> law, constitution	Still emission rights in Swiss and EU emission trading are largely allocated without charge.
financial transaction tax (Tobin tax)	indirect taxation of investment-inherent GHG emissions: up to 1 bn CHF/a	Constitution and law	Ideally coordinated with EU, which is currently debating the introduction of a FTT
earmarking of fines from new passenger car efficiency tool to climate fund	revenue greatly fluctuating, estimated 1–100 M CHF/a	Existing instrument of the CO <sub>2</sub> law	Fines are to be allocated to climate funds rather than the road financing fund.
compensation obligation for car importers	100 % compensation of fuel emissions: reduction of up to 16 M t CO <sub>2</sub> /a	Existing instrument of the CO <sub>2</sub> law	Measures to be used only for mitigation.
flight ticket tax	tax on international flights (e.g., 20 CHF per ticket): min. 500 M CHF/a	aviation law, constitution (possibly)	(cf. chapter 'Aviation')
Creating new revenue streams (e.g., increasing the credit line of the Swiss Development Cooperation Agency or the Swiss Environmental Agency)	Increase development aid to the internationally promised 0.7 % of Swiss GDP: 1.3bn CHF/a (additional)	Global credit of Swiss Development Cooperation Agency /Swiss Environmental Agency	Can be implemented without legislative measures if there is the political will.
climate fund min. 1 bn CHF/a	At least 50 % of the money for adaptation projects abroad, emission reductions of ca. 100 Mt CO <sub>2</sub> eq	(as from 2020)	Climate fund is fed from one or more of the measures outlined above.

# An effective climate policy means reducing the GHG balance to zero

## Implement the Paris Agreement now!

The world community has pledged in a legally binding way to definitively limit climate warming to well below 2, if possible at 1.5 degrees C. To this end the greenhouse gas emissions must decrease substantially from now, the climate gas balance has to be positive by 2050 at the latest.

Rich countries like Switzerland have pledged to be in a pioneering role, now deeds are called for. All of the ten climate levers on pp. 6/7 are prominent, the one goal holds true for all: net zero climate emission. The Climate Master Plan sketches out an economy-compatible mix of measures for ideal emission pathways in the various sectors. Let us take on the challenge now, let us board the climate-compatible train today! According to the timetable, 60% of the current GHG domestic emissions should be eliminated by 2030 (from almost 50 to 20 Mt CO<sub>2</sub>eq/a).

Globally poor peoples which are particularly exposed to climate change depend on our support in emission reduction and adaptation. Further delays will come at a high cost for future innocent generations.

This sink path presupposes an annual reduction rate of 4%, which is ambitious, but feasible. The speed of reduction will not be equal in all sectors. Some important measures are ready to be implemented and can yield swift success (e.g. in the buildings sector), other will need more time (e.g. aviation).

Whether or not we reach the goal of a 60% reduction of domestic emissions is entirely within our responsibility. So is reaching the Paris goal of net zero by 2050 at the latest.

The federal government's reduction proposal of 1% per annum will not suffice. Even the European Union and the United States propose a reduction rate of 2%/a.

## The main measures

As a rule, (almost) all measures make economic sense if all climate consequence costs are taken into account. The crucial factor is that these measures must comprise all sectors and all pollution emitters – and that they can be felt.

### Domestic implementation

- traffic: introduction of performance-related tax on passenger
- buildings: increase of CO<sub>2</sub> levy on heating fuel
- industry: extension of CO<sub>2</sub> levy into comprehensive GHG levy
- agriculture: introduction of levy on agricultural GHG emissions

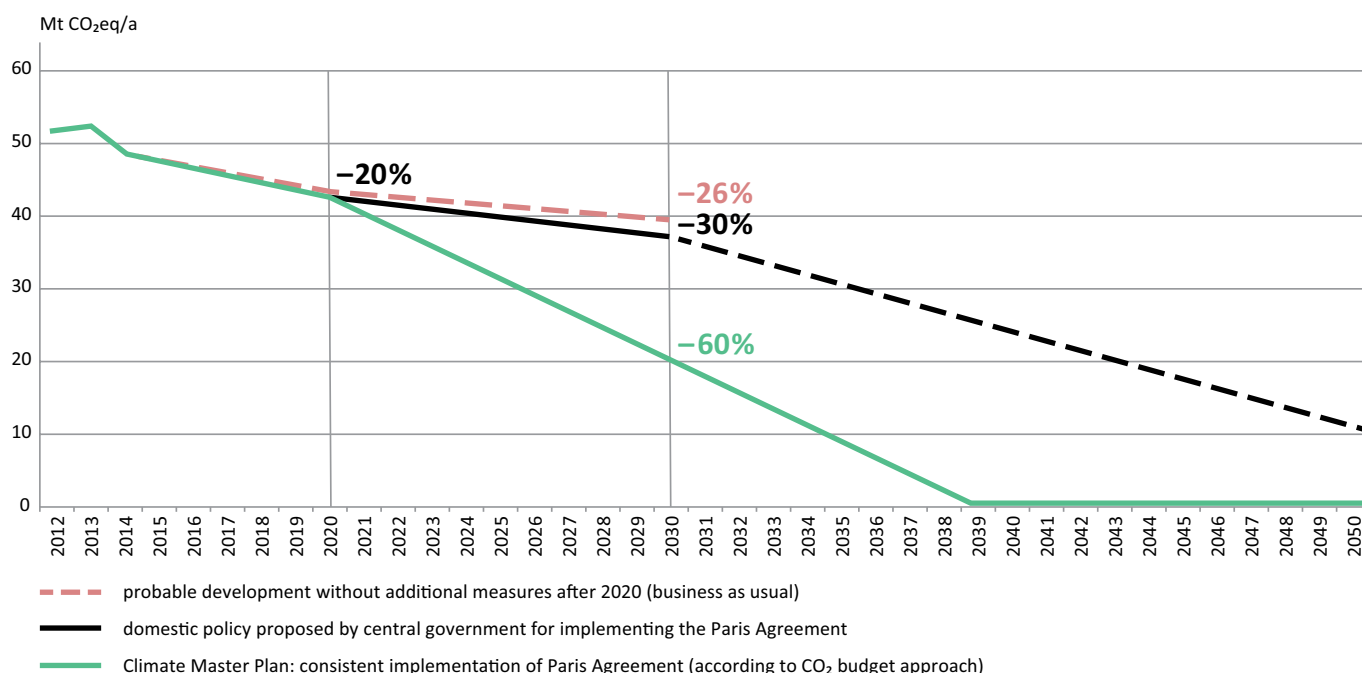
### Domestic measures with additional impacts abroad

- electricity: introduction of 'dirty electricity' levy on non-renewable electricity (including imports)
- grey emission import /export: introduction of a comprehensive GHG levy/consumption tax on imported products
- aviation (from Switzerland): introduction of climate tax on every ticket
- financial centre Switzerland: no investments in climate-harming infrastructures (rather divestment)

### International coherence

- International cooperation: demanding a consistent climate foreign policy of all projects and decision-making bodies
- Foreign investments: implementation of target-oriented, coherent investment rules
- Climate protection support: allocation and use of sufficient means from GHG tax (see above)

## The pathway of Switzerland: Climate Master Plan is indispensable



*The challenge:  
Reduce emissions by 4% each year.*

### Implementation time frame: insist!

The goal of a GHG reduction by 60% is feasible if the measures suggested above are implemented swiftly and consistently. Unfortunately, the effect of adaptation processes in inert systems with long investment cycles is delayed. Buildings are the best example: on average they are replaced every 100 years. The lack of investment or divestment has a negative effect for decades – this constitutes a great path dependency. The implementation of the Paris Agreement is urgent: it is crucial that the measures described above are enacted immediately and the necessary sink path is taken before 2020. Delay would necessitate far more drastic reduction rates, which would be more expensive and more difficult.

Equally the climate policy framework ought to, today rather than tomorrow, prevent misinvestments in greenhouse gas-intensive infrastructure. Only when the financial industry judges the dependence on CO<sub>2</sub>-intensive processes to be too high-risk, investments will be directed to more climate-friendly pathways.

Last but not least, Switzerland has to fulfil its promises to support the poorest, most vulnerable countries. Without swift measures the Paris goals will be unreachable in spite of great efforts.

### Key words

- **Zero:** Switzerland and all other nations must direct their climate policy immediately and consistently towards net zero climate gas emissions.
- **Here & now:** Switzerland must at least double its climate protection engagement. The government's plan for the revision of the CO<sub>2</sub> law delivers only half of the necessary reduction for the limitation of warming.
- **Everybody, all:** The promise of Paris implies that all sectors must now equally contribute to the ultimate goal. Laissez-faire is no option anymore.
- **Responsibility:** Switzerland and the other rich countries that caused much of the climate change problem must face their responsibility for climate impacts in poor countries.
- **Global:** Switzerland contributes globally more than its due to global warming. It can and must reduce the GHG emissions caused abroad directly or indirectly, since these outnumber domestic emissions several times. The Swiss financial centre and the pension schemes are to orient themselves towards a world economy resting on renewable energies.

**"Solutions for climate change are on the table now.  
Let us have the courage to grasp them.,,"**

Ban Ki-Moon, UN General Secretary, Paris COP21 (Dec. 2015)

### The actors

- Optimal harmonisation of measures at the levels of municipalities, states and federal government is a crucial precondition to implement the Paris Agreement successfully.
- In the key sectors of buildings and traffic esp. the cities have climate-effective wiggle room as regards planning and implementation. Due to ambitious goals in the energy and climate sectors they can have a broad effect as pioneers and trail blazers.
- There is no lack of innovative firms in the Swiss economy (ranging from small and medium-sized businesses and service providers to industrial producers and financial institutions), which have integrated climate-aware action in their business plans. Their voices must make themselves heard.

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All documents available at [www.klima-allianz.ch](http://www.klima-allianz.ch)

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The Alliance for Responsible Climate Policy, short Climate Alliance Switzerland, was set up in 2004. The 66 member organisations of the Alliance are engaged in Switzerland assuming its climate

political responsibility: it is to fully embrace its opportunities to make a fair contribution to avoid the dangerous damage caused by climate change. [www.klima-allianz.ch](http://www.klima-allianz.ch)

