Carbon taxation: Comparing France and Switzerland

Alexandra Fiedler, Theresa Rihs

The ongoing climate crisis calls for decisive action on many fronts. One instrument adopted by various countries and endorsed by organizations such as the International Monetary Fund is carbon taxation. Based on a literature review, this paper explores the structure, effectiveness and social distribution of carbon taxation in France and Switzerland. A comparative conclusion is drawn.

1 Introduction

Climate change is an ever-present threat to the world as we know it today. This, of course, is not a new development. The harmful effects of greenhouse gases on the climate have been known for decades. But it is now that the urgency can be felt more than ever before. Drastic action needs to be taken for there to be even a chance of reaching the goals agreed on in Paris in 2015.

In recent years the awareness of the problem has begun to shift from scientists and activists to the society at large, politics and economic organizations such as the International Monetary Fund (IMF). It was this last organization which, in one of its most recent publications, Finance & Development (Perry 2019), called for a broad implementation of carbon-pricing as a means to curb climate change.

The benefits of carbon pricing, be it in the form of an existing tax, a separate fee or a trading system, are manifold. On the most basic level the reasoning is that raising the price of a good is an incentive to lower individual consumption or switch to a cheaper alternative. With the projected savings from these changes in consumer action alone, Ian Perry (2019), author of the IMF article and environmental fiscal policy expert, argues that some countries could reach their goals. Another argument in favor of carbon pricing is that it generates substantial revenues. Comprehensive pricing, relative to the economic strength of a country, could result in revenues of one to two percent of the GDP (Perry 2019). These funds could go towards offsetting economic effects of climate change or could be invested in green infrastructure and technology directly. The last benefit is of a pragmatic nature: carbon pricing is (relatively) easy to implement. It can be incorporated into existing taxes or organized as a national or international trading system.

Worldwide, there are already around 60 carbon pricing schemes on various levels of government and in many different forms. Yet, the average price for a ton of CO_2 is as low as two dollars, which is far from enough to reach the global climate goals (Perry 2019). To see how carbon pricing works in practice and to explore both the opportunities as well as the pitfalls it holds, this paper will present and compare two existing national systems: that of France and that of Switzerland. After a separate discussion of these systems regarding their structure, their effectiveness to reduce carbon emissions, as well as the social distribution of the resulting tax burden, a comparative conclusion will be drawn.

2 France

2.1 Structure

In France carbon is priced directly by two different systems: The European Union Emissions Trading Scheme (EU-ETS), in which all the EU Member States have to participate, and the Climate Energy Contribution. Both will be explained further in the following paragraphs.

European Union Emissions Trading Scheme (EU-ETS)

In 2005 the EU-ETS was implemented by the EU. 45% of all emissions within the EU, including CO_2, parts of N2O and perfluorinated hydrocarbons (PFC) emissions, generated by fossil energy production from fossil power plants, heating networks, refineries, energy-intensive industries and since 2012, the European Aviation are bound to emission trading (Boyotte 2018).

First an upper limit of total greenhouse gas emissions in the EU is determined for each year. Then the member States of the EU decide an upper limit to the emission certificates. One certificate is equivalent to one ton of emitted carbon dioxide and is referred to as tCO_2eq. The named sectors must buy as many emission certificates as they have verified emissions, otherwise they will be sanctioned. If they have a surplus of certificates, they can trade them freely on the market (Boyotte 2018).

In France 20% of the emissions (about 100 $MtCO_2eq$) are covered by the EU-ETS (Boyotte 2018).

Climate Energy Contribution

In 2014 France added a CO_2-component to its internal energy consumption tax. It is binding for private and commercial consumers, but the sectors of the EU-ETS (named above) are excluded to avoid double taxation.

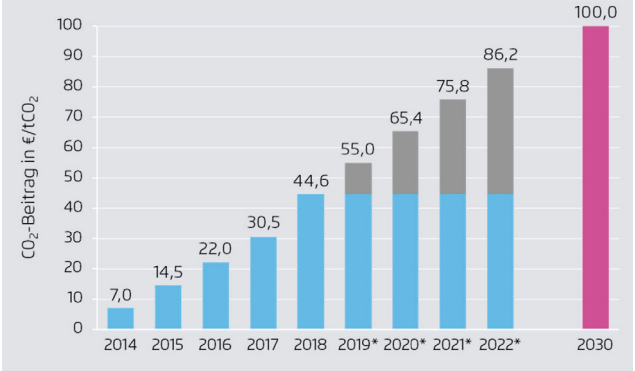
The Climate Energy Contribution is part of already existing taxes

- Internal natural gas consumption tax
- Internal coal consumption tax
- Internal energy consumption tax

The intake of the CEC is claimed to be partly used to finance renewable energy and energy rehabilitation. However, the money is not legally bound to be used in that way and proceeds to levy the general state budget (Gagnebin et al 2019).

The Government of Emanuel Macron wanted to expedite the increase of the CEC rate to about 10€/tCO_2 per year to fight climate change and increasing air pollution (Boyotte 2018). Because of the Yellow West protests, which started

Illustration 1: Planned CO2-Rates in France *currently suspended



Source: Gagnebin et al. 2019

in October 2018, the planned increase of the CEC on the 1st January 2019 was delayed indefinitely (Willsher 2018). 40% of the emissions (about 180 $MtCO_2eq$) are covered by the CEC (Boyotte 2018).

2.2 Effectiveness in Reducing Carbon Emissions

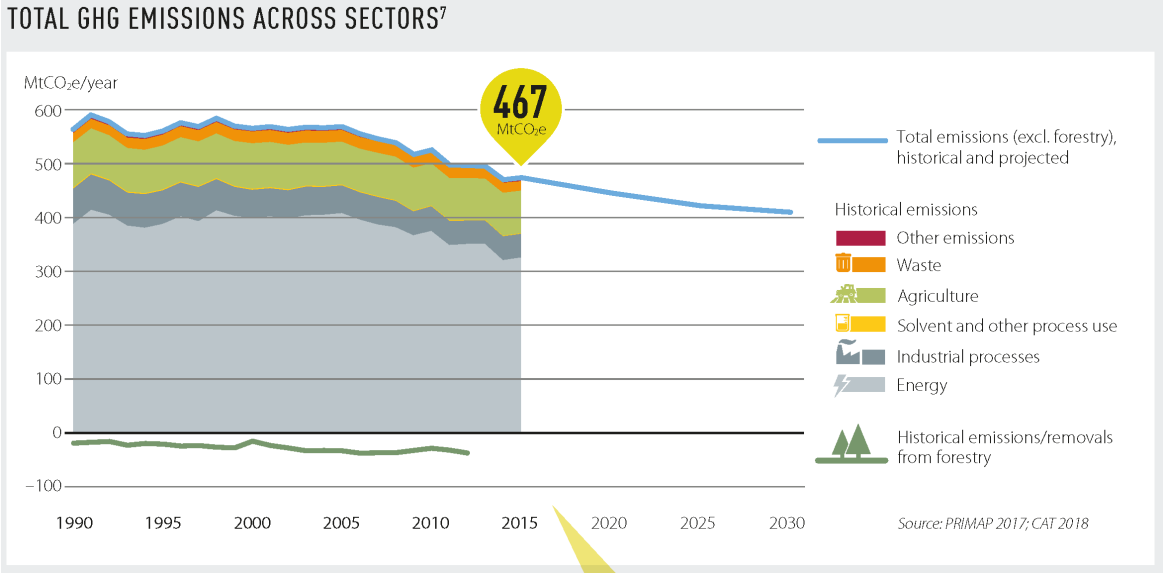
France, like almost every country in the world except the United states of America and Syria, has recognized the Paris agreement of 2015 and therefore agreed to limit global warming to 1,5°C. France wants to become carbon neural by 2050. The CEC is supposed to be a tool to reach this goal, by raising the price per tCO_2 yearly.

Although France has decreased its total greenhouse gas (GHG) emissions by 16% between 1990 and 2015 (see fig. 2) (Climate Transparency 2018), it still missed its goals for 2018 in three of four main sectors (see fig. 3) (Chrisafis 2019). Between 2015-18 the annual emissions decreased only by 1,1%. This rate would have to be tripled by 2025 to reach the targets set by the Paris Climate agreement (Chrisafis 2019).

CO_2 Emissions from the energy sector, which includes transport, household, services and agriculture, industries and electricity, account for the largest proportion in overall GHG emissions in France, which have decreased by 2% between 2012-2017 (see fig. 4) (Climate Transparency 2018).

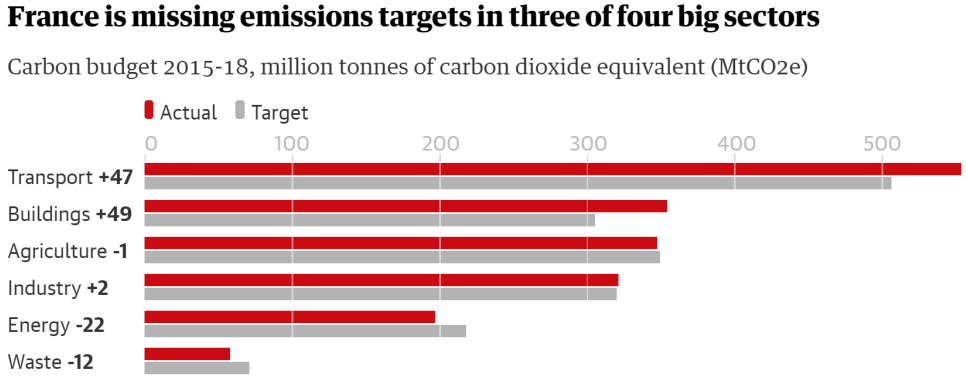
It is hard to say if and by how much the CEC influenced this decrease. In France taxes are generally not bound to be used for a certain purpose, and the CEC is no exception here because legally it is only an increase in energy taxes in general. However, part of the mineral oil tax is used to finance the agency of transport infrastructure (Agence de financement des infrastructures de transport de France, AFITF) and a special account for the energy transition (Compte d'Affectation Spécial „Transition Energétique"),

Illustration 2: Total emissions across sectors



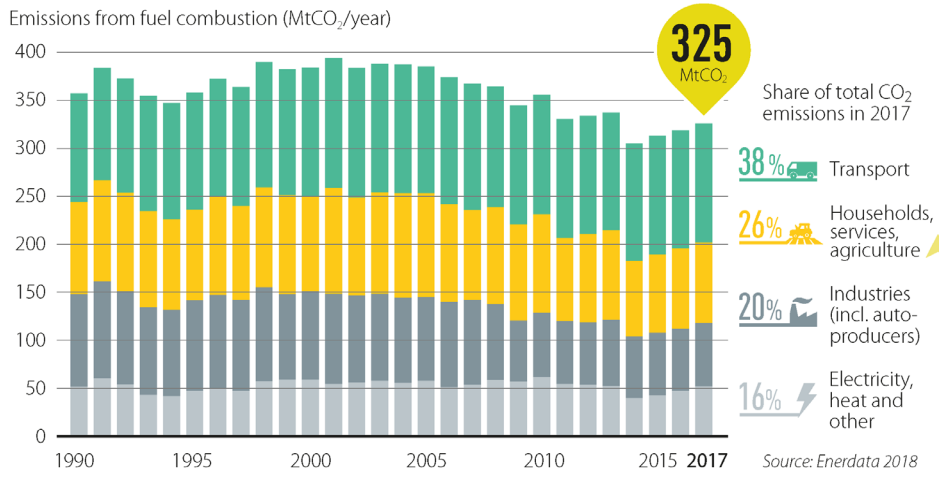
Source: Climate Transparency 2018, p. 3

Illustration 3: Carbon Budget 2015-18



Source: Chrisafis 2019

Illustration 4: Emissions from fuel Consumption



Source: Climate Transparency 2018, p. 3

while the rest of the earnings of the mineral oil tax is used for the tax compensation of companies (which will be explained further in the next chapter) or goes to the state budget (Gagnebin et al 2019).

Of course, the government of France implemented climate protection measures which are financed through the state budget and so indirectly through the CEC such as subsidy programmes to modernise heating systems and credits with low interest rates for energy rehabilitation of buildings.

It can thus be argued that part of the CEC is used for energy transition and for some implementations to reduce CO_2 emissions, but there is no guarantee that all the earnings are used for climate protection measures (Gagnebin et al 2019).

2.3 Social Distribution of Costs

The government of France compensates companies directly for the energy consumption tax they pay, to ensure their global competitiveness. Private persons, meanwhile, are not getting compensated. This leads to a situation where the main contributors to CO_2 emissions, companies, are not actually paying for their emissions and ordinary people who are only responsible for very little of the CO_2 emissions in France have to bear the whole weight of the CEC. Apart from the fact that many feel this to be gravely unjust, it also defies the purpose of encouraging companies to lower their CO_2 emissions (Gagnebin et al 2019).

The reason for the Yellow West Protests in 2018 was not the raise of the CEC alone. The government led by Emanuel Macron wanted to raise the CEC ambitiously while simultaneously cutting a lot of social benefits, increasing the social insurance contribution and limiting the adjustment of the social benefits to 0,3% for 2019 and 2020, which is below the inflation rate. In addition to the fact that companies get a direct tax refund and private customers do not, there is no guarantee that the money obtained through the CEC is actually used to fight climate change. As a consequence, the approval rate of the CEC by the people of France was very low.

Furthermore, the increased price of gas is especially hard on people with a lower income who cannot afford to live in the cities with their very high rents. Often there is no or only very poor coverage of public transportation in rural France, so for many people the car is the only option for their commute. The combination of these things as well as general frustration about social inequality were the reasons why many people in France started to protest in 2018, although most people agree that the government should act against climate change (Gagnebin et al 2019). Due to these protests the planned raise of the CEC to 56€ for the year 2019 was suspended (Willsher 2018).

3 Switzerland

3.1 Structure

In an attempt to curtail the emission of carbon produced in Switzerland the government introduced a carbon tax scheme in 2008, called the Lenkungsabgabe. It works as a fee and dividend system, meaning that the major part of the revenue gained by the state is redistributed to the people paying it. This serves the purpose of lessening the burden of taxation, felt proportionately higher by households with a lower income.

The Swiss model started out by charging 12 Swiss franks (CHF) per ton of CO_2. This rate could be adjusted upwards, if emission reduction goals were not met, which was the case in every review so far, raising the price per ton gradually up to the 96 CHF it stands at as of 2019. There is, however, an upper limit of 120 CHF per ton of carbon set by the law in question (Bruderer Enzler, Diekmann 2019). Seeing that Switzerland has not yet met its climate goals, it seems possible that the carbon fee will be raised further in the future. In terms of total revenue, the Swiss carbon fee brought in around 1,2 billion CHF in 2018 (BAFU 2018). Which, as a point of reference, is about as much as the state makes in estate, inheritance and gift tax each year (OECD.stat 2020).

What is important to consider when discussing the Swiss model is what goods it affects. Contrary to many other carbon schemes, such as the one in France, fuels for transportation are exempt. The two big categories of taxed goods are heating fuels and volatile organic compounds (VOCs). The former is relevant to both private households as well as companies, as it contains things such as gas and oil for heating, while the latter pertains mostly to chemical industries, such as the manufacture of paint. This rather narrow focus has been a point of contention when it comes to evaluating the Swiss model, as some claim that the carbon fee should be applicable to goods from other carbon intensive sectors, such as transport, as well (Bruderer Enzler, Diekmann 2019).

However, it has to be said that in addition to the carbon fee there is also a separate fee concerning fuel for transport, more specifically petrol and diesel, which is colloquially called the “Klimarappen”. The existence of this scheme needs to be acknowledged when discussing the Lenkungsabgabe, as it helps to account for the exemption of mobility from the fee and dividend system, although it will not be touched on in detail in this paper as it operates in a different way and does not factor into the revenue redistribution, which will be examined in more detail in following chapters. As of January 2020, Switzerland is also part of the EU Emissions Trading Scheme, already discussed in the previous chapter. Previously it had a separate, internal Trading Scheme (BAFU 2019b).

3.2 Effectiveness in Reducing Carbon Emissions

The ecological effectiveness of a carbon tax manifests itself in two major ways. For one, the increase in the price of targeted goods serves as an incentive to consume less of them, thereby directly reducing carbon consumption. The other important aspect is how the revenues of a fee or tax are used by the state. In order to achieve the highest level of positive ecological effects funds are exclusively used for green investments, such as the funding of renewable energy or the thermal rehabilitation of building stocks (Böhringer, Müller 2014). However, there is an argument to be made against this approach. Mainly it concerns the trade-off between ecological and social sustainability.

The Swiss government seemed to be aware of this conflict and opted for a mixed approach. Two thirds of the revenue gained are redistributed as a lump sum to the people and companies paying the fee, while the other third is bound to ecological investments, mainly subsidies for thermal rehabilitation of buildings, which in 2018 came out to be around 450 mil. CHF. Some of the funds are also allocated to a research fund. In 2018 this amounted to 25 mil. CHF.

According to Swiss Bundesamt für Umwelt (BAFU) the country is rather close to reaching its emission goals, at least those of the second Kyoto period, ending in 2020. In the building and heating sector the goal was within reach at the date of the last climate goal report in 2017 (BAFU 2017), but it was pointed that it could only be achieved by further measures one of which being the carbon fee, which was subsequently raised to its current level in 2018. The effects of the fee on overall carbon emissions are difficult to measure, but at least in the affected sector it seems to have a considerable effect.

This can be seen in the overall trendline of goals in the building and heating sector (see fig 5). While there is rather large annual fluctuation, most of it due to uncharacteristically mild or harsh winters as well as external influences, the overall trend is decidedly declining. As of the making of the last model in 2015 whether or not the 2020 goals would be met was within the range of annual fluctuation and not at all impossible, especially in view of the raise of the carbon fee in 2018.

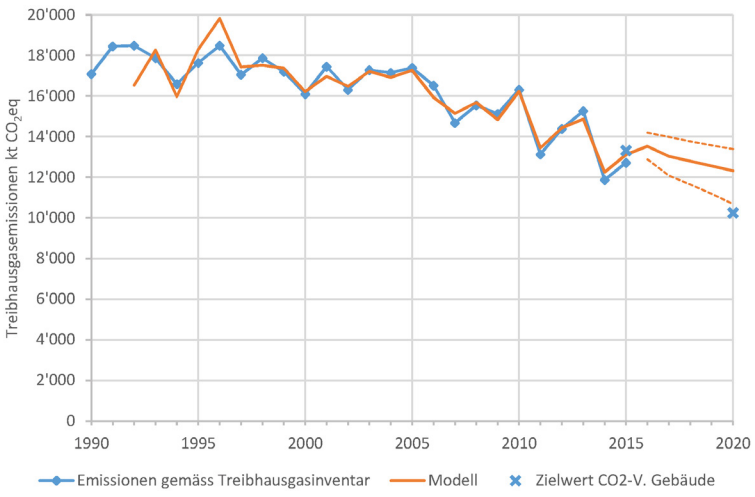
The explicit effect on the consumption of thermal fuels can be seen even more clearly in the following graph (fig. 6). Though the decline in the use started before the introduction of the fee in 2008, the downturn has accelerated since then and is especially noticeable when contrasted with the use of motor fuels over the same period of time which have actually increased slightly. However, it has to be noted that more often than not the decrease was not pronounced enough to meet the goals and as such prevent the raise of the carbon price.

3.3 Social Distribution of Costs

As touched upon in the previous chapters redistribution of revenue is a central issue of the Swiss carbon fee model, seeing as it is a fee and dividend system. The way it works in practice is that the two thirds of the revenue not spent on refurbishing subsidies and the research fund are divided equally among every person and company based in Switzerland and therefore contributing to the fee. The dividend is always calculated in advance, based on a model of the coming year, any discrepancies will be accounted for in the following year. The payment for 2020 will come out at 77,4 CHF per person.

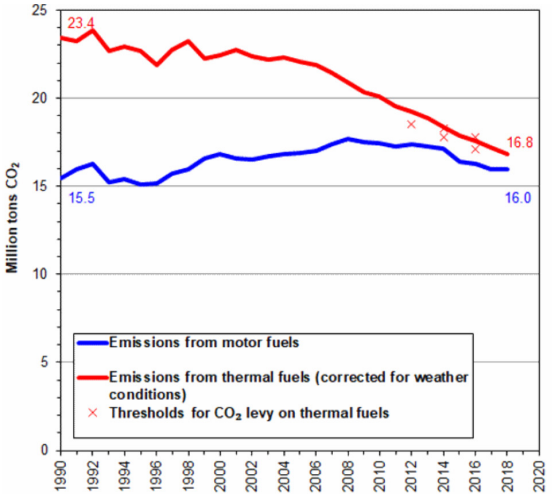
The actual transaction is achieved through a health insurance reimbursement, as everyone in Switzerland is required to have such an account. Using this existing structure reduces the administrative cost of redistribution and

Illustration 5: CO_2 Emissions in the sector housing and heating



Source: BAFU 2017, p. 6

Illustration 6: Comparison between emissions from motor and thermal fuels



Source: BAFU 2019a

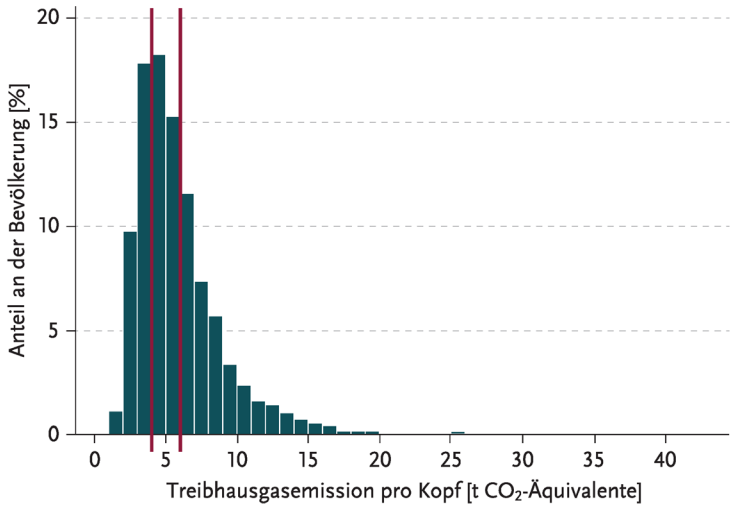
is more likely to reach everyone eligible, both due to up-to-date records as well as the fact that it is a system based on residency rather than citizenship (Bruderer Enzel, Diekmann 2019).

Because everyone receives the same amount as a lump sum payment and not through tax cuts or write-offs, the progressive character of the refund is further amplified, meaning that lower income households generally see a net positive, while higher incomes pay more than they receive back. As a result, the Swiss carbon fee acts actively against social inequality (though the impact is not large enough to counteract other regressive tendencies).

The reason why it is socially sustainable, while systems without dividends are not, is that the burden of any fee is felt proportionally more by people with little income, as the same price equates to a larger percentage of disposable income than it does for a higher income person, even if the latter is statistically more likely to use more carbon and therefor pay more. In Switzerland right now about a third of people get reimbursed more than they actually paid in (see fig. 7), because the majority of people and companies use less thermal fuels than the average. This is due to the fact that a small number of users consume drastically more, thereby skewing the average away from the median.

Of course, the scheme could be even more progressive if 100 per cent of the revenue were redistributed, which would mean a net gain for nearly two thirds of the population (see fig. 7). An even more comprehensive approach might stipulate that only people below a certain wage threshold should be eligible, but there seem to be no such considerations within the Swiss government.

Illustration 5: Distribution of emissions per capita across the population



People left of the left red line have a net gain from the 2/3 redistribution. People left of the right red line would have a net gain from a complete redistribution. Source: Bruderer Enzler, Diekmann 2019, p. 273

It also has to be noted that the fee and dividend system is not perfect when it comes to social sustainability, because it relies on the assumption that people with less income use less carbon, which may not hold across the board. People in rural communities who rely on their cars for commuting might see a net loss, even with redistribution taken into account. Special subsidies for these cases could be considered, though it does pose a conflict with the goals of ecological sustainability (Bruderer Enzler, Diekmann 2019).

4 Conclusion

Carbon tax may be a means to move towards a more ecologically sustainable form of economy. However, certain criteria need to be considered. As an example, France and Switzerland both implemented the same basic idea of pricing a ton of CO_2 but differed in its execution, resulting in different social effects on and acceptance.

After the implementation of the carbon tax, both countries achieved a decrease in their CO_2 emissions. In doing so, Switzerland is closer to meeting its current goals of carbon emissions than France, which missed its goals in 2018 in three of four major sectors. The impact of the tax schemes as a single factor, on the reduction of emissions is very difficult to determine and attempting to do so would exceed the scope of this paper. It can be assumed though, that the political intent of carbon taxes at least guides the people and businesses in the direction towards reducing CO_2 emissions.

One aspect that appeared clearly in the comparison of France and Switzerland is how important the social aspect of a carbon tax scheme is. In France, the implementation of the Climate Energy Contribution led, among other political changes, to nation-wide protests, which resulted in the indefinite delaying of the planned price rise on CO_2. Whereas in Switzerland the acceptance of the "Lenkungsabgabe" is relatively high and even an increase in the price of CO_2 is currently discussed.

In conclusion, carbon tax schemes are one of the policy tools to implement more ecologically sustainable economies, which can help lower CO_2 emissions of a country. But in the authors' opinions, a tax scheme alone, even if implemented by all countries in the world, is not enough to address or even solve the ongoing climate crisis. Generally, there needs to be an overall shift towards a more environmentally and socially aware economic system. It seems plausible that in such a system the economic value of businesses is not only determined by their profits alone,

but also by their impact on the environment and on the communities they operate in. However, carbon taxation may still be one potentially useful tool to help achieve such a shift.

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