

The Swiss Climate Penny: An innovative approach to transport sector emissions

Anne Arquit Niederberger*

Policy Solutions, 333 River Street (1228), Hoboken, NJ 07030, USA

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Abstract

Under a voluntary agreement with the Government, the Swiss private sector proposes to launch an innovative Climate Penny Fund. Oil importers agree to contribute CHF 0.01–0.02 for each liter of gasoline and diesel sold. The measure will generate at least CHF 70 million annually to finance climate protection projects domestically and abroad, enabling Switzerland to eliminate the anticipated transport sector compliance gap and to fulfill its greenhouse gas emission reduction obligations. At reasonable cost, the Climate Penny buys time to implement transport sector policies, develop low-emission technologies/infrastructure and facilitate behavioral changes, while still delivering real, measurable and long-term climate mitigation results.

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1. International climate policy context

1.1. UN climate convention and Kyoto Protocol

The United Nations Framework Convention on Climate Change (UNFCCC) is the foundation of global efforts to combat global warming. Most members of the Organization for Economic Cooperation and Development (OECD) plus the states of Central and Eastern Europe—known collectively as Annex I countries—committed themselves to adopting policies and measures aimed at returning their greenhouse gas emissions to 1990 levels. The Convention recognizes that the extent to which developing country Parties implement their commitments will depend on financial and technical assistance from the developed countries.

The Convention entered into force on 21 March 1994 and has been ratified by 188 countries (and the European Community) to date. The Kyoto Protocol to the UNFCCC (which entered into force for 140 countries and the European Union on 16 February 2005 and now boasts 150 signatories) contains legally binding emissions targets for

Annex I (industrialized) countries: These countries are to reduce their collective emissions of six key greenhouse gases by at least 5% on a CO₂ equivalent basis. This group target will be achieved through cuts of 8% by the European Union (with agreed differentiated targets for the individual EU Member States), most Central and East European states and Switzerland; 7% by the United States of America;¹ and 6% by Canada, Hungary, Japan and Poland. Russia, New Zealand and Ukraine are to stabilize their emissions, while Norway may increase emissions by up to 1%, Australia by up to 8%,¹ and Iceland 10%. Each country's emissions target must be achieved for the period 2008–2012, calculated as an average over the 5 years. Demonstrable progress must be made by 2005.

1.2. Kyoto mechanisms

One key element of the Kyoto Protocol are the three 'Kyoto mechanisms', which give countries geographical and temporal flexibility in meeting their emission limitation

¹ However, the Bush Administration announced that the US will not ratify the Protocol. As the US accounted for 36% of total Annex I emissions of greenhouse gases, and the Bush climate policy is estimated to result in a 30% increase in emissions compared with the 1990 level (PEW, 2002)—rather than the 7% decrease that the US agreed to in signing the Protocol—the net impact of the Kyoto Protocol will be significantly less than a 5% reduction. Australia has also indicated that it does not intend to ratify.

* Tel.: +1 2019634647.

E-mail address: policy@optonline.net.

commitments. An international emissions trading regime will allow industrialized countries to buy and sell emission allowances (in the form of assigned amount units, AAUs, or removal units resulting from carbon sinks, RMUs) amongst themselves. These Annex I countries will also be able to acquire emission reduction units (ERUs) by financing climate protection projects in other developed countries (commonly referred to as joint implementation, JI). In addition, a clean development mechanism (CDM) will enable industrialized countries to finance emission reduction or certain kinds of sink enhancement projects in non-Annex I countries and to receive credit (in the form of certified emission reductions, CERs) for doing so, while at the same time supporting project host countries in their domestic sustainable development efforts. The use of these three flexibility mechanisms is to be supplemental to domestic action.

Many nations that have already ratified the Kyoto Protocol have stated that they will integrate the Kyoto flexibility mechanisms into their domestic or regional climate policies. The EU, for example, launched its community-wide Emission Trading Scheme on 1 January 2005 (EU, 2003).

2. Swiss climate policy and road transport emissions

2.1. Kyoto Protocol emission reduction obligation

Switzerland ratified the Kyoto Protocol in July 2003 and is obligated to reduce its total emissions of greenhouse gases on a carbon dioxide equivalent (CO₂e) basis by 8% on average during the first commitment period 2008–2012, compared with the 1990 level. This obligation pertains not only carbon dioxide emissions from the combustion of fossil fuels, but also to non-energy related CO₂ emissions, as well as to emissions of other greenhouse gases (i.e. methane, nitrous oxide, perfluorocarbons, chlorofluorocarbons, and sulfur hexafluoride).

In 2002, the most recent year for which official inventory data are available, the total greenhouse gas emissions of Switzerland were 1.7% below the 1990 level, with the road transport sector responsible for 30% (15.80 Mt CO₂e) of the total emissions of 52.25 Mt CO₂e (SAEFL, 2004: 24). Switzerland's Third National Communication to the UNFCCC (SAEFL, 2001) outlines the comprehensive set of measures already implemented, which limit greenhouse gas emissions, in particular, the SwissEnergy Program.² However, whereas emissions from combustibles are shrinking, transport-related emissions exceeded their 1990 level and are projected to grow, without additional measures.

² See Baranzini, Thalmann and Gonseth (2004) for a detailed description of the SwissEnergy Program and voluntary agreements.

2.2. Swiss CO₂ Act

To help meet Swiss emission reduction obligations under the Kyoto Protocol, the Swiss Parliament approved a CO₂ Act, which entered into force on 1 May 2000.³ Under the Swiss CO₂ Act, overall CO₂ emissions from the energetic use of fossil fuels must be reduced to 90% of the 1990 level by 2010, disaggregated into subsidiary targets for combustibles (minus 15%) and transport fuels (minus 8%). As carbon dioxide is responsible for approximately 80% of Swiss emissions, the CO₂ Act is a crucial element of Swiss efforts to uphold its Kyoto obligation.

The CO₂ Act differentiates between two distinct phases: Only if voluntary climate mitigation measures and other CO₂ relevant policy measures in other sectors turn out to be insufficient to achieve the reduction targets (Phase 1) can the Federal Council (executive branch of Government) decide to introduce a CO₂ tax on sales of fossil fuels (Phase 2). Under the umbrella of the Government's SwissEnergy Program, performance contracts with several private agencies have been signed. An Energy Agency of the Privat Sector was established, for example, to facilitate and coordinate agreements between enterprises and the Government. These voluntary agreements⁴ contain emission reduction targets and could serve as a basis for firm commitments that would entitle companies to a tax exemption, should the tax be implemented.

The CO₂ tax could be applied individually or jointly to combustibles and/or transport fuels, and the tax rate(s) should be set at level(s) that are adequate to ensure the required reduction(s) (but at a rate not exceeding CHF 210/t CO₂) and must be approved by Parliament. Should a CO₂ tax be necessary, the CO₂ Act stipulates that it is to be implemented as a revenue neutral incentive tax, with all revenues (minus administrative costs) to be refunded to individuals (on a per capita basis) and the private sector (in proportion to each entity's social security contributions).

Actual Swiss carbon dioxide emissions have fluctuated within $\pm 5\%$ of the 1990 emissions level and were 0.7% below the 1990 level in 2002, the most recent year for which data are available (BUWAL, 2004). The latest government estimate is that—without new measures—CO₂ emissions will have decreased by 3.8% by 2010 (compared with the 1990 level), which falls far short of the 10% reduction

³ For information on Switzerland's federal democratic governance system, refer to 'The Swiss Confederation: A Brief Guide 2005' (www.admin.ch/ch/e/bk/buku/buku2005/index.html).

⁴ On 23 April 2004, the Swiss Department of Environment, Transport, Energy, and Communications concluded a voluntary agreement with the Energy Agency of the Private Sector on behalf of 600 enterprises. Together with an individual agreement concluded between the Government and the cement giant Holcim, companies representing approximately 40% of industrial sector CO₂ emissions are currently engaged in voluntary agreements to cut CO₂ emissions.

Table 1
Swiss transport sector emissions (on- and off-road)

	Total greenhouse gas emissions from transport ^a (Mt CO ₂ e)	Percent of base year (1990) GHG emissions	Total CO ₂ emissions from transport ^b (Mt CO ₂)	Percent of base year (1990) CO ₂ emissions
1990 Emissions Data ^a	15.93	100.0	15.46	100.0
2002 Emissions Data ^a	17.14	107.6	16.51	106.8
2010 Target	NA	NA	14.23	92.0
Difference between actual 2002 emissions and 2010 target value (CO ₂ Act)	NA	NA	2.3	14.8
CO ₂ Act Compliance gap projected for 2010 ^c	NA	NA	2.4 ^c	15.5

NA, not applicable.

^a Inventory data (SAEFL, 2004: 23) and updates.

^b BUWAL (2004: 5) and updates.

^c Projection (Prognos, 2005).

required by the CO₂ Act, and sensitivity analysis indicates that the expectation of a compliance gap overall, as well as with respect to each of the two subsidiary targets, is robust through 2010 (Prognos, 2004). Thus there is a sizable compliance gap with respect to this domestic legislation, in particular, with respect to the target for transport fuels.

2.3. Compliance gap for transport sector

Efforts in the transport sector need to be strengthened quickly, if Switzerland is to meet its domestic and Kyoto legal obligations. According to the most recent Swiss greenhouse gas emission inventory submitted to the UN Framework Convention on Climate Change, carbon dioxide emissions from the transport sector were nearly 7% above the 1990 level (base year) in 2002 (Table 1). This represents a potential compliance gap with respect to the 2010 target in the Swiss CO₂ Act of nearly 15%, which is predicted to be maintained through 2012. Road transport emissions from gasoline and diesel are responsible for 97% of total transport sector CO₂ emissions.

It is evident that a significant CO₂ tax on transport fuels will be needed, if new and effective voluntary and/or legal measures are not undertaken immediately. As a first step, the Swiss Department of the Environment, Transport, Energy, and Communication (Etec) signed a voluntary agreement with auto importers on February 19th, 2002, which calls for a reduction of the average fuel consumption of new cars sold in Switzerland by about 3% per year, from 8.4 l/100 km in 2000 to 6.4 l/100 km in 2008, which was expected to reduce carbon dioxide emissions by about 0.75 Mt CO₂ annually during the 5-year Kyoto commitment period. As a supporting measure, an energy label for new cars sold in Switzerland has been required since 1 January 2003. The label makes it possible for consumers to compare the fuel use (l/100 km), carbon dioxide emissions (g/km) and relative energy efficiency (system of seven categories, taking into account differences in car weight) of new cars.

However, unless there is a more rapid shift from conventional gasoline to hybrid or diesel engines (which have a greater CO₂ efficiency per kilometer driven⁵) in the new car fleet, this voluntary agreement will fail to deliver the required reductions. Under current Swiss taxation policy, diesel prices are consciously held higher than gasoline prices; as a result, diesel cars currently make up only about 10% of the Swiss car fleet, significantly lower than neighboring countries, although this fraction is growing (diesel currently accounts for about 21% of new car sales (auto-Schweiz, 2004)). The Government has stated that it will only adopt a diesel tax incentive policy once diesel filters are in use that can limit the adverse health risks of particles emitted from diesel engines. One step in this direction was the simultaneous introduction on January 1st, 2004, of a CHF 0.03/l incentive tax to promote sulfur free transport fuels, and the decision of oil companies to import and produce only sulfur free fuels (sulfur concentration of < 10 ppm) as of that date. Sulfur free fuels allow the use of more efficient engine types and are required for the proper functioning of filters to retain cancer-causing fine particles (PM10) emitted by diesel engines.

Similarly, achieving the target fuel efficiency gains will require the introduction of a 'fee-bate' system for vehicle taxes, which optimistically could encourage emissions reductions of 0.3 Mt CO₂ annually, which is about 40% of the overall reduction expected from the voluntary agreement (Infras, 2003).

The bottom line at present is that—even if the voluntary agreement with auto importers results in a 2% per year decrease in the average fuel consumption of all new cars sold in Switzerland (which exceeds the actual reduction achieved for 1996–2002 of 1.58% annually) and diesel cars account for 30% of new car sales by 2010—a compliance gap of about

⁵ For all new cars sold in Switzerland in 2003, the average specific CO₂ emissions per kilometer driven were 9.1% lower for diesel-powered (181 g/km) than for gasoline-powered automobiles (199 g/km); auto-Schweiz (2004).

2.4 Mt CO₂/y on average is anticipated (Table 1). Tax incentives for gas/bio-gas as a motor fuel are also under consideration, but would do little to change this picture, as their impact is only estimated at 0.025–0.052 Mt CO₂ annually in 2010 (Infras, 2003). This means that the Swiss transport sector must achieve a further 12 Mt CO₂e emission reductions during the initial Kyoto commitment period 2008–2012 to ensure compliance with domestic legislation.

2.4. Advocacy coalitions and policy change

2.4.1. Policy alternatives

According to the Swiss CO₂ Act, the introduction of a CO₂ incentive tax is seen as a last resort, to be implemented only if other sectoral policies and voluntary measures, which can include the use of the Kyoto mechanisms, are insufficient to ensure compliance. As the Government anticipates a significant compliance gap, two basic policy options to ensure compliance with the motor fuel reduction target were initially under political consideration:⁶ (i) introduction of a revenue-neutral CO₂ incentive tax of CHF 0.30/l and (ii) creation of a Climate Penny Fund to be financed by voluntary contributions from Swiss oil importers and invested in climate mitigation projects.

The Climate Penny aims to ensure voluntary compliance with the emission reduction requirement of the Swiss CO₂ Act for motor fuels, while contributing to sustainable development, by financing a mix of domestic emission reductions/incentives and Kyoto mechanism transactions. The Climate Penny concept and major features of the proposal are shown in Fig. 1 and Table 2, respectively.

2.4.2. Political process and outcome

The Swiss Federal Council was unable to agree on either of these alternatives and—much to the consternation of stakeholders across the political spectrum—instead decided in June 2004 to undertake a formal consultation procedure on four options (UVEK, 2004; UVEK, 2005b):

1. CO₂ tax on both fuel oil (CHF 0.09 per liter of 'extra light', or CHF 35 per ton CO₂) and motor fuel, starting at CHF 0.15 per liter (CHF 64 per ton CO₂) and increasing to CHF 0.30/l (CHF 128 per ton CO₂).
2. CO₂ tax on both fuel oil (as above) and transport fuel (but at a rate of only CHF 0.15 per liter), with 2% of the tax revenues being used by the Government to acquire Kyoto certificates via emission trading, CDM and/or JI. This option would require modification of the existing CO₂ Law, which is currently conceived as a revenue-neutral incentive tax.
3. Tax on fuel oil at CHF 0.09 per liter (as above), combined with a voluntary agreement with the private

⁶ In both cases, a CO₂ tax on stationary sources was also proposed. In addition, a combination of these two approaches (with CO₂ tax levels of CHF 0.10–0.20/l) was also evaluated.

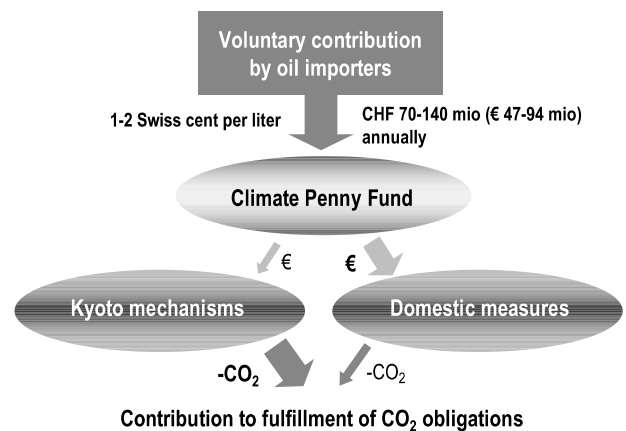


Fig. 1. The Climate Penny concept. Swiss oil importers will conclude voluntary agreement with the Government under which they agree to contribute CHF 0.01–0.02 per liter of motor fuels sold in Switzerland. The contributions (amounting to CHF 70–140 mt annually) flow into the Climate Penny Fund, which is administered by an independent, non-profit foundation. Most of the Fund will be used to provide financial incentives for domestic greenhouse gas reductions, but it is expected that Kyoto certificates will cover a larger fraction of the compliance gap, because of their current and anticipated relatively lower cost.

sector to implement a 'Climate Penny' to offset transport sector emissions; a CO₂ tax could be introduced subsequently on motor fuels, if the agreement failed to achieve the agreed result.

4. Voluntary agreement with the private sector to implement an 'integral Climate Penny' to offset emissions in both the stationary and transport sectors (a CO₂ tax could be introduced subsequently, if the agreement failed to achieve the agreed result).

The formal consultation process ran from 20 October 2004 through 20 January 2005 and, on 23 March 2005, the Federal Council decided in favor of the third option, including a Climate Penny for motor fuels (UVEK, 2005a), without, however, providing a justification. The Government still maintains the option of levying a CO₂ tax on motor fuels at a later date, if the Climate Penny fails to deliver.

According to the Government (UVEK, 2005b), the analysis of views expressed by the 255 entities that took position in the consultation process⁷ did not result in a clear majority for any of the four options indicated above (Fig. 2), although a majority did support a CO₂ tax on stationary sources, which is to be implemented in 2006 (UVEK, 2005a).

With respect to motor fuels, center-right political parties (Christian Democratic Party, CVP; Liberal Democratic Party, FDP), the majority of cantons, the private sector, in general (and the oil importers, farmers and tourism sector, in particular), as well as road transport associations, were in favor of the voluntary Climate Penny approach. Political parties on the left of the political spectrum (Green Party,

⁷ The consultation generated great interest: Although only 156 entities were invited to submit views, 255 submissions were received.

Table 2
Main features of the Climate Penny initiative

Objective	To ensure voluntary compliance with the emission reduction requirement of the Swiss CO ₂ Act in the transport fuels sector, while contributing to sustainable development, by financing a mix of domestic emission reductions and Kyoto mechanism transactions.
Legal basis	CO ₂ Act (voluntary agreement with the ETEC)
Implementing agency	A new non-profit foundation will be created to administer the climate Penny Fund. Oil companies will voluntarily contribute to the Fund on a per litre sales basis
Launch date	1 January 2006 (tentative)
Level of contributions	CHF 00.013–CHF 0.019 per litre
Annual Fund contributions	Approximately CHF 90–135 mio
Resulting emission reductions	9 Mt CO ₂ -equivalent in total for the period 2008–2012 (domestic reductions: at least 200,000 tons annually; allowances and/or emission reductions via the kyoto mechanisms: ≤1.6 mio tons annually)

GP; Social Democratic Party, SP); environmental, consumer, labor, renters’, and development organizations preferred a CO₂ tax.⁸

The Department of the Environment, Transport, Energy, and Communication has been tasked with working out the details to make Option 3 operational. This includes preparing the necessary ordinance regarding the use of the Kyoto mechanisms by Switzerland (in the context of its overall climate policy), which is expected to be issued by the Federal Council before the summer recess in June 2005, as well as negotiating a voluntary agreement with the Climate Penny promoters (or Foundation) to address issues such as the level of the voluntary contribution by the private sector, the fraction of investment in domestic reduction-s/incentives and Kyoto mechanism transactions and the definition of implementation milestones. Negotiations on the voluntary agreement began in May and will be concluded by mid-August 2005, paving the way for full operation of the Climate Penny.

2.4.3. External triggers for policy change

The inclusion of the Climate Penny in the policy alternatives proposed by the Federal Council can be regarded as a major policy shift (Arquit Niederberger, 2005) and is consistent with the outcome that the advocacy coalition framework (ACF) for explaining policy change⁹ would predict (Sabatier and Jenkins-Smith, 1999). The actor analysis of the Swiss climate policy subsystem performed

⁸ See UVEK (2005c) for a detailed analysis of the comments received under the consultation procedure (also available in French and Italian).

⁹ For further background on the Advocacy Coalition Framework, as well as examples of how it has been applied in the Swiss climate policy context, see Sabatier and Jenkins-Smith (1999); Arquit Niederberger (2005); Lehmann and Rieder (2002).

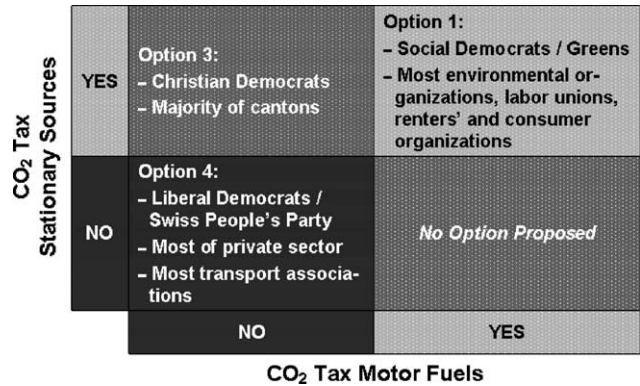


Fig. 2. Major blocks of support for the climate policy options proposed by the Federal Council. Based on the Government’s assessment of the 255 submissions it received through the consultation procedure (UVEK, 2005b), there was no clear consensus among political parties and interest groups in favor of any one of the four options; whereas Option 2 lacked the support of any major block. Most support was concentrated at the poles of the policy continuum (either a pure CO₂ tax or an ‘integral’ Climate Penny across all sectors). The Federal Council opted for a compromise solution (Option 3), leaving the door open to introduce a CO₂ tax on motor fuels after 2007, if necessary.

by Lehmann and Rieder (2002) identified three coalitions: government, business and greens. In the case of the Climate Penny Initiative, the business coalition—led by interests represented by the Swiss Oil Association, the Touring Club of Switzerland and the Federation of Swiss Truck Drivers—co-opted the Climate Penny concept from a policy broker to exploit the opportunities presented by several external perturbations to the climate policy subsystem, namely:

- Changes in socio-economic conditions: Due to projections for an unexpectedly large budget deficit in 2004 (approximately CHF 3.5 billion, compared with a total income of CHF 47.9 billion), which was considered to be mainly structural and not cyclical in nature, the Federal Council and the Swiss Parliament elaborated a serious deficit reduction program in 2003. In this context, the government’s own analysis that a CO₂ tax of CHF 0.30/l would result in federal gasoline tax revenue losses of approximately a half a billion US dollars annually¹⁰ (mainly as a result of a reversal of tank tourism to neighboring countries) thus worked to the advantage of the alternative Climate Penny Initiative, even though proponents of the tax pointed to long-term external benefits exceeding the up-front economic costs.
- Changes in the systemic governing coalition: On 10

¹⁰ It is remarkable that this major economic impact of the CO₂ tax was not even mentioned in the Message that the Federal Council presented to Parliament when the CO₂ Act (the legal basis for the introduction of the CO₂ tax) was submitted for parliamentary approval, even though the document included a chapter on the financial implications of the CO₂ Act. This is another indication that the climate policy subsystem has been shaken by external events over the past 5 years; today, neither the Federal Council nor parliament would tolerate such an omission.

December 2003, two new Members were elected to the seven-person Federal Council, which shifted the political orientation of the Executive clearly to the right. For the first time in history, the conservative Swiss People's Party was able to increase its representation in the Federal Council from one to two members (at the expense of the Christian Democrats). This shift reflected the fact that recent successes in parliamentary elections had made the Swiss People's Party the strongest in the Legislative Branch.

- Developments in other policy subsystems, in particular, negative votes on ecological tax reform: The electorate rejected a constitutional amendment on ecological tax reform in September 2000 (by a margin of 55.5–44.5%) and, in 2001, over 3/4 of voters turned down a popular initiative to tax energy instead of employment to secure the Swiss social security system. Although transfer of the tax burden to energy remains a central objective of the Federal Council, these clear votes have blocked government support for tax reform efforts in recent years. Thus, even though a legal basis for implementation of the CO₂ tax exists, the Federal Council is aware of public (and parliamentary) resistance to its implementation.
- Policy decisions at the international level: The inclusion of the Kyoto mechanisms in the UN Kyoto Protocol (led by the United States) led to their introduction in the Swiss CO₂ Act. Unlike other European governments, the Swiss Government had no plans for public procurement of Kyoto certificates to meet its emission limitation obligation, but pressure from the business coalition to include provisions for voluntary agreements and to allow entities to make use of the flexibility mechanisms established the legal prerequisites for the Climate Penny Initiative.

The ACF posits that significant external perturbations such as these are a necessary, but not sufficient, cause of change in the policy core attributes of a governmental program (Sabatier and Jenkins-Smith, 1999). External events provide an opportunity for minority coalitions (in the case of Swiss climate policy, the business coalition) to push for a fundamental change in approach. Recent oil price increases also make the CO₂ tax a harder sell.

With Switzerland's consensual form of Executive decision-making, it is remarkable that the Climate Penny Initiative was proposed as an option by the Federal Council. Had the external drivers described above not converged, and had there been no indication of a compliance gap with respect to Swiss obligations under the Kyoto Protocol, the outcome may have been different. As it was, the Government and the private sector promoters of the Climate Penny Initiative entered into a consensus process. Such a power sharing arrangement among coalitions can only occur when there is pressure to act (Sabatier and Jenkins-Smith, 1999). This pressure to negotiate alternative policy instruments came in the case of the Government coalition from the stipulations of the Swiss CO₂ Act and the Kyoto Protocol, coupled with the respective projected compliance

gaps. Given the structure of the CO₂ Act, which allows for the Climate Penny be implemented under a voluntary agreement between Government and the private sector, this 'unholy alliance' between the government and business coalitions may be more stable than one would otherwise expect.¹¹ The experience of SwissEnergy has demonstrated that cooperation between the private sector and Government can be quite successful (EnergieSchweiz, 2003), and it is anticipated that the domestic incentives provided by the Climate Penny Fund will be implemented in close coordination with the SwissEnergy framework and according to its rules (controlling, reporting, etc).

3. Analysis of the Climate Penny Instrument

3.1. Critical Issues in the Domestic Policy Debate

Despite the June 2004 announcement by the Federal Council that the Climate Penny was under serious consideration by the Swiss Government, the proposal was criticized by 'green' NGOs.¹² Others, such as the Social Democratic Party (SP Schweiz, 2004) or the Advisory Body on Climate Change Research and Policy (OCCC, 2004) merely stated a preference for the alternative CO₂ tax—or for a combination of both instruments—without categorically opposing the Climate Penny. This section provides an overview of the key criticisms of the Climate Penny initiative raised during the early policy process.

Although not specific to the Climate Penny proposal, using the Kyoto mechanisms allows an Annex I Party to reduce the absolute amount of domestic emission reductions it must achieve to ensure compliance with the Kyoto Protocol. It was argued that the partial 'outsourcing' of emission reduction services inherent in the Kyoto mechanisms has a number of disadvantages relative to a hypothetical alternative policy scenario (e.g. a CHF 0.30 per liter CO₂ tax):

- Swiss transport emissions can continue to grow virtually unchecked, because the voluntary contribution of CHF 0.01–0.02 may or may not be passed on to motorists by oil importers and, in any case, lies within the daily motor fuel price volatility.
- The significant local external costs of road transport (in particular, health-care costs) (Jochem and Jakob, 2004) are not internalized. In other words, the domestic environmental co-benefits that would otherwise accrue

¹¹ An alternative explanation is that the nature or composition of the major coalitions may already have shifted with respect to the analysis performed by Lehmann and Rieder (2002).

¹² Greenpeace Switzerland, the Association Transports et Environnement and WWF Switzerland, for example, put out a series of climate policy fact sheets (see, in particular, www.wwf.ch/images/progneut/upload/2_Klimarappen_dt.pdf) and lobbied against the Climate Penny.

from greenhouse gas mitigation measures in the transport sector are foregone (Baranzini and Thalmann, 2003), which is not efficient, from the perspective of the national economy.¹³

- Price differentials with neighboring countries are perpetuated, thus maintaining status quo levels of gasoline ‘tank tourism’ (because Swiss gasoline prices are lower than in neighboring countries, motorists from surrounding countries tend to purchase gasoline in Switzerland; the opposite, however, is true of diesel prices). Because the Swiss economy profits both directly (gasoline sales) and indirectly (gasoline tax revenues) from tank tourism, this economic dependency is a barrier to ecological tax reform and cost internalization.
- Innovation and the development of promising emission reduction technologies (and hence the medium- to long-term options for climate mitigation) would not be promoted. Note that this statement is not backed by in-depth research on the policy, national circumstances and sector in question, and that the proponents of the Climate Penny have made the opposite argument, pointing to the dependence of Swiss technology manufacturers on export markets. Serious analysis on feedbacks between policy options and technology innovation is lacking.

Some have also suggested that the Climate Penny will contribute to higher Annex I greenhouse gas emissions overall by allowing surplus emission allowances to be traded and/or overestimating the additional greenhouse gas reductions achieved through CDM projects. However, this criticism is directed not at the Climate Penny per se, but presumes that the institutional arrangements, rules and procedures agreed for the Kyoto mechanisms by Switzerland and other Parties to the UN Kyoto Protocol are not credible.¹⁴

Another issue that was raised with respect to the Climate

¹³ Although it has been argued that the benefits of the CO₂ tax would at least equal the costs and therefore justify its implementation on economic grounds (Jochem and Jakob, 2004), many assumptions and implicit value judgements are involved in such modeling work (e.g. the tax revenue losses of over CHF 600 million annually estimated to result from a reversal of tank tourism due to a CHF 0.30/l tax (Infras, 2003) were not included in the calculation).

¹⁴ Far less speculative are calculations that the alternative CO₂ tax would shift a significant portion of the Swiss transport sector emissions to the books of neighboring countries, which Switzerland has no control over, without actually reducing them (Jochem and Jakob, 2004; Infras, 2003).

¹⁵ This argument is not consistent with the design of the initiative according to its promoters; according to them, the Climate Penny Fund is to be financed with voluntary contributions from the Swiss oil importers, based on the amount of gasoline and diesel each company sells. Although all Swiss oil importers agree to make the same voluntary contribution per liter of gasoline/diesel, each company is free to decide whether or not to pass the ‘cost’ of this contribution on to its customers; however, as the level of the voluntary contribution is within the range of short-term price volatility, it will be impossible to know which policy is followed in practice. Furthermore, the Climate Penny Fund will not be managed by the oil importers, but by an independent, non-profit foundation.

Penny initiative was whether or not there was an adequate legal basis to implement it. Those who claimed that the Initiative was unconstitutional saw it as a hidden tax on consumers managed by private interests who make profits from selling fossil fuels¹⁵ (SP. Schweiz, 2004). There was also some opposition to tying what was viewed as taxation revenues to climate mitigation measures, rather than adopting a pure incentive tax to be recycled back into the economy.

Finally, there was debate on the question of whether or not the Climate Penny represented prohibited price collusion under competition law. According to the Parliamentary Competition Commission, the Climate Penny would represent a ‘significant limitation on competition’, but not price collusion (Wettbewerbskommission, 2004). In the end, the Federal Council ruled that the oil company contributions were in the interest of the public and were therefore allowed.

3.2. Overall assessment

Many of the criticisms raised were not specific to the Climate Penny, but found fault with the nature of the Kyoto flexibility mechanisms themselves (Section 3.1), despite the fact that the Kyoto mechanisms are already anchored in Swiss law and the Kyoto Protocol, which was ratified by Switzerland. As a result, much of the political wrangling was focused on the supplementarity clause of the Kyoto Protocol and how it should be interpreted in the context of the Climate Penny Initiative. One interpretation of supplementarity (which may deviate from the final stipulations of the ordinance regarding the application of the Kyoto mechanisms under the Swiss CO₂ Act, which is currently under preparation) is illustrated in Fig. 3.

According to this interpretation of supplementarity, the Climate Penny will deliver at least 200,000 tons of CO₂ reductions through domestic mitigation efforts, as well as up to 1.6 million tons of CO₂ equivalent allowances/reductions in Kyoto ‘currencies’ (e.g. assigned amount units from emission trading, certified emission reductions from CDM projects) in the year 2010. Switzerland’s total domestic reduction effort, taking into account additional reductions achieved by existing and planned new measures (such as the CO₂ tax on combustibles, which will be implemented on 1 January 2006 and is expected to reduce emissions by 0.7 Mt CO₂ annually in 2010), will result in at least 6.9 Mt CO₂ reductions by 2010. This level of domestic reductions represents over 80% of the total reductions achieved from the business-as-usual trend) or well over half of the reductions below the 1990 base year level).

Under business-as-usual conditions and policies, Switzerland cannot meet its Kyoto mitigation obligation. Thus the advantages and disadvantages of the Climate Penny must be evaluated not against the *status quo*, but against a hypothetical alternative policy scenario. In the case of Switzerland, the plausible alternative policy scenario must

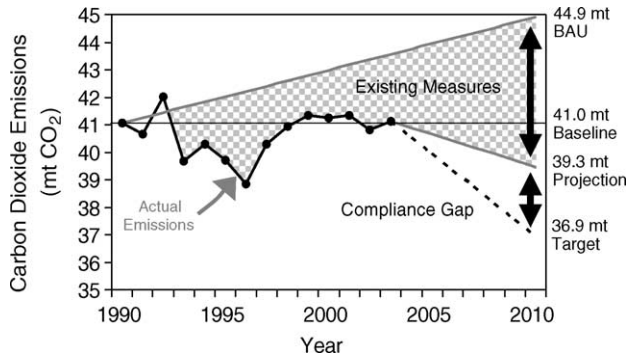


Fig. 3. Business-as-Usual, actual and CO₂ Act compliance path emission trends. Despite projected domestic CO₂ reductions of 13% in 2010, compared with the BAU trend since 1990 (Jochem and Jakob, 2004), existing measures (including the Energy 2000/SwissEnergy programs) are inadequate to achieve the absolute (–10%) reduction required by the Swiss CO₂ Act (Prognos, 2005). The Climate Penny will deliver 1.8 Mt CO₂ e annually in the year 2010 via a combination of domestic emission reductions and Kyoto certificates, which—together with existing measures, a new CO₂ tax on combustibles and two proposed taxation measures—will ensure compliance with both domestic and Kyoto legislation.

be consistent with the existing CO₂ Act. In a study performed on behalf of the Swiss Agency for Environment, Forests and Landscape, the authors assumed a CO₂ tax of CHF 0.30 per liter as the alternative policy scenario (Infras, 2003), which corresponded most closely to Option 1 that had been under consideration by the Federal Council (UVEK, 2004).

Drawing on this study, Table 3 summarizes the characteristics of the Climate Penny and the CO₂ tax with respect to a number of relevant criteria. This analysis was based on certain assumptions regarding the Climate Penny that do not reflect its ultimate design, most importantly, the ratio of domestic to Kyoto emission reductions, which will be significantly higher than the 20:80 ratio assumed in the study.

Nonetheless, the table highlights some of the advantages put forth by the supporters of the Climate Penny (compared with a CHF 0.30/l CO₂ tax), namely:

- Greater cost efficiency of climate protection, taking advantage of Kyoto mechanisms in the transport sector, which has the lowest elasticities and highest marginal abatement costs for real domestic emission reductions of any sector in the Swiss economy;
- New financial incentives for domestic technology innovation and greenhouse gas reduction efforts (taking advantage of the most cost-effective opportunities in all sectors and for all greenhouse gases), which exceeds the existing budget for the SwissEnergy program (EnergieSchweiz, 2003);
- Credible greenhouse gas reductions from domestic and Kyoto mitigation projects, based on strict validation, monitoring and verification procedures according to the rules of SwissEnergy and the Kyoto Protocol (and an opportunity to propose credible methodologies for CDM

Executive Board approval and subsequent use by others (Arquit Niederberger, 2003));

- Anticipated local sustainable development benefits (e.g. socio-economic, environmental) for Kyoto transaction partner countries, although no quantitative data are available;
- Remaining flexibility to implement a CO₂ tax at a later date, if necessary, to reach the Kyoto target;
- Greater political acceptance, taking into account recent votes on ecological tax reform and other external factors outlined above.

The major shortcoming of the Climate Penny with respect to the CO₂ tax is that it indirectly facilitates a delay in implementing ecological tax reform and the internalization of external costs in motor fuel prices. On the other hand, given the critical mass of external perturbations to the climate policy subsystem outlined above—from public rejection of ecological tax reform proposals in 2000 and 2001 to concern over lost tax revenues in light of serious budget deficits—it is unlikely that the Swiss Parliament would have adopted a sufficiently high tax level for Switzerland to comply with its domestic and international climate policy obligations.¹⁶ In fact, the decision of the Federal Council to give the Climate Penny a chance suggests that the voluntary initiative was the only politically viable new instrument to enable Switzerland to uphold its legal obligations in the short term.

4. Conclusion and outlook

Switzerland is unique in that it has adopted domestic legislation that requires a specific level of CO₂ emission reductions from the transport sector by 2010. Given the fact that the compliance gap in 2002 already stands at 14.5% and that short-term elasticities in the transport sector are low, achieving the –8% target under existing legislation with domestic measures alone would only have been possible with either a substantial CO₂ tax (that would increase fuel prices by at least 20% per liter) or with the Climate Penny approach that was ultimately adopted. Although the Climate Penny offers no direct incentive for individual motorists to change their behavior, it buys time for Switzerland to implement new transport sector policies, to develop low- and no-emission technologies/infrastructure (and provide incentives for their application via the Climate Penny Fund) and to facilitate behavioral changes through a combination of instruments that might be much more cost-effective than a high CO₂ tax alone (WBCSD, 2004). Developing countries are counting on the Kyoto mechanisms to direct additional financial resources their way, so that they may fulfill their own obligations to mitigate climate change,

¹⁶ Approximately 60 parliamentarians formed a committee to lobby for adoption of the Climate Penny approach.

Table 3
Assessment of the Climate Penny vs. a CO₂ Tax

Criterion	Climate Penny	CO ₂ tax	Comment
	Voluntary contribution by oil importers of CHF 0.01/l, invested in: domestic mitigation (all sectors) Kyoto mechanisms	Incentive CO ₂ tax of CHF 0.30/l Tax breaks for alternative fuels	
<i>Greenhouse gas reduction</i>			
Total reduction	Kyoto mechanisms: 2.0 Mt CO ₂ e/y; domestic mitigation: 0.5 Mt CO ₂ e/y	CO ₂ tax: 2.2 Mt CO ₂ e/y; rest from tax breaks for alternative fuels	Compliance gap of 2.5 Mt CO ₂ e/y
Ratio of domestic: foreign reduction according to Kyoto inventory methodology	20:80 (based on various assumptions)	100:0 (based on territorial principle)	Only 40% of the total impact of the CO ₂ tax on the Swiss emissions inventory is due to real emissions reductions in Switzerland; the rest is due to a reversal in tank tourism
Verifiability	Given, according to international Kyoto rules	Formally given, but fate of 60% of 'reduction' effect of CO ₂ tax due to reversal of tank tourism is not under Swiss control	
Risk of Swiss non-compliance with Kyoto obligation	Relatively low (price risk, contractual risk, project risk)	Difficult to set tax level accurately; financing for tax breaks not secured	
<i>Cost factors</i>			
Cost efficiency	Kyoto certificates: CHF 18/t CO ₂ e; domestic mitigation: CHF 200/t CO ₂ e	CO ₂ tax: CHF 235/t CO ₂ e	Cost efficiency of Climate Penny domestic mitigation assumes restriction to high-cost transport sector measures
Total cost	approx. CHF 110 mio	approx. CHF 620 mio	
<i>Impact on national budget</i>			
CO ₂ tax	Not applicable	Budget neutral (proceeds of CHF 1.6 bio fully recycled)	
Mineral oil tax	No effect	CHF 650 mio annual income loss	This loss of tax revenues was not declared as a potential financial impact when the CO ₂ Law was presented by the Executive to parliament for approval
<i>Co-benefits</i>			
Domestic, long-term	None assumed	Reinforcement of structural changes in transport sector	No quantitative analysis performed in <i>Infras (2003)</i> study; Climate Penny will also reinforce structural changes, since it will promote, e.g. bio-alcohol.
Other (e.g. CDM/JI host country)	Not assessed	Not assessed	Requires further analysis

Source: Adapted from *Infras (2003: 59)*; comments by author.

while at the same time making progress on poverty alleviation and local sustainable development.

In the big picture, the Swiss debate about a CO₂ tax versus the Climate Penny is of little consequence with respect to global progress on emission reductions; many individual corporations emit more than Switzerland as a whole. Yet the Swiss debate raises a number of broader policy issues:

- Can the transport sector offsetting approach be applied in other political jurisdictions or even globally, and is this advisable? Further analysis on desirability, feasibility and design would be needed. In the long term, and on a broader scale, sustainable mobility cannot be achieved through a carbon offsetting approach alone, but it may be a useful tool.
- How will emerging climate policy regime(s) address the issue of gray greenhouse gas emissions embedded in traded products? As we face up to the need to reduce

emissions drastically within decades, taking into account the principle of common but differentiated responsibility included in the Climate Convention, this issue will resurface as a major political consideration.

- To what extent should cost-benefit analysis consider the impacts of public policy alternatives beyond national boundaries? Climate change and our responses to it will effect people worldwide, and new policy instruments under the Kyoto Protocol allow nations geographic flexibility in fulfilling greenhouse gas reduction obligations. To respond to ethical and equity concerns that are at the heart of the climate policy debate, classical methods designed to aid policymakers in evaluating policy alternatives, such as cost-benefit analysis, must be adapted or supplemented by new approaches. Academic and government policy analysts have done a poor job of making implicit the value judgments and tradeoffs that underlie their analyses and thus forgone the opportunity

to promote public debate to shape the concept of sustainable mobility.

The Climate Penny may well have the potential for broader application, even though other countries may not be under regulatory pressure to reduce transport sector emissions to a specific level by 2010. A US fund built on voluntary contributions corresponding to the parameters set for the proposed Swiss Climate Penny Fund, for example, could generate over \$9 billion annually for investment in climate mitigation programs.¹⁷ A US fund could provide financial incentives for low-carbon/energy efficient transport technologies/fuels, thus reducing demand for foreign oil, or contract for greenhouse gas emission reductions amounting to 1 billion t CO₂e annually (assuming a carbon price of US\$ 9 per ton of CO₂e). If only half of this amount were used to purchase offsets, approximately 25% of the US transport sector emissions projected between 2002 (1.86 billion tons CO₂) and 2010 (2.25 billion t CO₂) could be offset on an annual basis (EIA, 2004).

Thus the measure could be a big help in promoting efficient, climate-friendly technologies and/or directly addressing growth in transport sector emissions, and would be consistent with a wide range of proposed international and domestic policy proposals, such as action targets under the UN climate regime (Goldberg and Baumert, 2004) or the 5-year, \$1 billion energy efficiency and biofuel incentive program called for recently by a consortium of former US national security officials (Energy Future Coalition, 2005).

In contrast to Switzerland, some countries have great leverage to influence technology innovation in the auto sector through standards or incentives to promote low- or no-carbon fuels and technologies. The Climate Penny approach must be designed to complement—and even stimulate—rather than displace such crucial efforts.

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¹⁷ This statement is based on the following data and assumptions: (i) the level of voluntary contributions would be US\$ 0.055 per gallon (which is equivalent to a proposed Swiss Climate Penny contribution of CHF 0.015 per liter, with 1 CHF=0.8 USD); (ii) sales of gasoline (80%) and diesel (20%) amounted to 172 billion gallons in 2002 (Federal Highway Administration, 2001), and we use this reference year to make the calculation).

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