

Mitigating climate change in a federal country committed to the Kyoto Protocol: how Swiss federalism further complicated an already complex challenge

Juan Casado-Asensio¹ · Reinhard Steurer¹

Published online: 25 February 2016

© The Author(s) 2016. This article is published with open access at Springerlink.com

Abstract When policy scholars assess the effects of federalism on climate change mitigation, they often look at countries that rejected binding commitments (in particular, the USA) and find that federalism enabled sub-national entities to partly fill national regulatory voids. In accordance with a similar case study on Austria, we find the exact opposite for Switzerland, a country that committed itself to an 8 % cut in 1990 greenhouse gas emissions under the Kyoto Protocol. To reveal the detrimental effects of federalism, we focus our case study on the integration of climate change concerns into building policies, a policy field fully in the hands of Swiss sub-national authorities known as cantons. Apart from a few pioneer cantons, we found mainly federal departments concerned with integrating climate change mitigation into cantonal building policies and cantonal as well as federal actors struggling with the numerous pitfalls of Swiss federalism in their own ways. On the one hand, various federal departments tried repeatedly to facilitate a nationwide greening of cantonal building policies, and their interventions often resulted in lowest common denominator solutions that were difficult to improve once in place. On the other hand, Swiss federalism gave a few pioneer cantons the freedom to green their building policies early on, but their policies hardly diffused to other cantons. Resembling our main finding of the Austrian case study, we conclude that the 15 % emission decline in the Swiss building sector during 2008–2012 compared to 1990 levels happened despite, not because of Swiss federalism. This warrants caution against high hopes in assuming that decentralised or polycentric governance can fully compensate for failed national (or international) climate policies.

Keywords Federalism · Environmental federalism · Climate change mitigation · Climate policy integration · Building policy · Switzerland

✉ Reinhard Steurer
reinhard.steurer@boku.ac.at

¹ InFER, Institute of Forest, Environmental, and Natural Resource Policy, BOKU - University of Natural Resources and Life Sciences, Feistmantelstr. 4, 1180 Vienna, Austria

Introduction

The effects of federal political systems on environmental policy-making have been studied for decades without providing clear answers (Millimet 2013). Some “environmental federalism” scholars explain the mixed findings with the different scales of environmental problems that should match the level of policy-making: while federal political systems seem to provide the flexibility necessary for solving local environmental problems such as water pollution, they seem to be inadequately fragmented for solving national or global environmental problems such as climate change mitigation (Esty 1996: 570; Macey and Butler 1996: 25; Adelman and Engel 2008). If the effects of federal political systems depended only on the scale of an environmental problem, this would be the end of the story, suggesting that federal political systems are ill-equipped to mitigate global climate change. However, countries lagging behind in climate change mitigation at the national level reopened the debate by providing counterevidence. Since the USA never ratified the Kyoto Protocol (Steurer 2003), several studies showed that its federal political system enabled its sub-national units (in particular, progressive states such as California) to successfully fill national regulatory voids (Rabe 2007; Lutsey and Sperling 2008; Corfee-Morlot 2009). Based on the USA and similar cases such as Canada and Australia,¹ one could conclude that federal states have considerable advantages in mitigating climate change compared to unitary ones. However, does this impression really hold true for European countries that have committed themselves to climate change mitigation under the Kyoto Protocol? For Austria, we have already shown that this is not the case (Steurer and Clar 2015). Given that the Swiss federal government ratified the Kyoto Protocol in 2003, the key questions to be answered here are: Did the Swiss federal system facilitate or hinder climate change mitigation? Does the Swiss case confirm our findings for Austria or those for the US?

Resembling our Austrian case study (Steurer and Clar 2015), we answer this question with a qualitative case design focusing on policies that aimed to green the building sector between 1990 and 2012 because it is mainly regulated by sub-national entities known as cantons. Apart from literature research covering academic studies, evaluations and policy documents, we draw on 15 semi-structured, standardised face-to-face interviews conducted in January 2013 with federal and cantonal policy-makers, as well as non-state climate experts involved in Swiss climate and building policies (see “Appendix” for an anonymised list of interviews). The interview guides were designed to answer our research question, accounting for the specific expertise of our interviewees on Swiss climate and building policies. In addition to analysing the integration of climate concerns into the building policies of all 26 Swiss cantons in general terms, we also had a closer look at three pioneer cantons: Basel-Landschaft, Basel-Stadt and Bern. We chose these pioneers because if Swiss Federalism facilitated mutual learning and a positive competition towards climate policy integration among cantons (for these and other potential advantages of federalism, see the following section), they would most likely have played a key role in this.

¹ Canada formally withdrew from the Kyoto Protocol in 2011 but started to ignore it much earlier (see <http://www.cbc.ca/news2/politics/story/2011/12/12/pol-kent-kyoto-pullout.html>; accessed 2 February 2016). Australia ratified the Kyoto Protocol only because it was granted a very weak mitigation target that allowed it to de facto increase its emissions (see <http://theconversation.com/australia-hit-its-kyoto-target-but-it-was-more-a-three-inch-putt-than-a-hole-in-one-44731>; accessed 18 December 2015). For the positive effects of federalism in Canada, see Rabe 2007, and for Canada and Australia, see Gordon and Macdonald 2014.

Furthermore, we expected them to be better informed and more critical about mitigation efforts by federal and other cantonal actors.

The following section introduces federalism and policy integration as the two main concepts of the present paper, and based on these concepts, it also operationalises how to assess the effects of federalism on climate policy-making. The section entitled “Constant federal dripping wears cantonal stones” presents the “nitty-gritty” of our case study. After introducing relevant aspects of Swiss federalism, it describes the main federal-level climate governance approaches and policy measures that aimed to achieve the Kyoto target. In a second part, it analyses horizontal and vertical efforts of integrating mitigation concerns into cantonal building policies. Finally, we discuss our main findings in view of our research question and we distil three main conclusions and their policy implications.

Federalism and policy integration

Federalism is a basic polity set-up in which “power is constitutionally divided between different authorities in such a way that each authority exercises responsibility for a particular set of functions” via its own institutions (Keman 2000: 193 who quotes Robertson 1985). Thus, “federal polity is characterized by ‘sharing power’ and by ‘dividing power’ in a vertical fashion” (Keman 2000: 193). In reality, this characterisation can play out in many different types of federalism, and according to Keman (2000), these types can be differentiated based on who has the “right to decide” and/or the “right to act” on certain issues. While the right to decide “refers to the competence to design and pass policies on its own or in cooperation with a superordinated institution” (Biela et al. 2012: 448), the latter is concerned with implementing policies adopted elsewhere (Keman 2000). For the purpose of our case study, it is sufficient to emphasise that the key instruments of Swiss building policies (i.e. building standards and subsidy programs) have traditionally been in the hands of the cantons, or less colloquially: the cantons are the ones who have “the right to decide” and “the right to act” on building-related policies in Switzerland that are relevant to the present study.

The policy performance of federal political systems is a longstanding puzzle of federalism studies in general, and of environmental federalism (i.e. studies concerned with the role federalism plays in environmental policy-making) in particular, and it is still unresolved. We focus our review on three frequently mentioned pros and cons of federalism (see also Steurer and Clar 2015). Parts of the (environmental) federalism literature emphasise the following three disadvantages of federal systems in solving (environmental) policy problems. First, a failure to coordinate actors and policies between different levels of government can result in redundant, incoherent or even contradictory and consequently ineffective policies (Peters 1998: 296; Goulder and Stavins 2010; Galarraga et al. 2011: 165). Second, a larger number of decision-makers and institutional duplicities make it more likely that policy changes are delayed and/or watered down, which usually implies high transaction costs (Tsebelis 2002). Third, the economic rivalry between sub-national entities can result in a race to the bottom of environmental standards, in particular when this enhances economic competitiveness (Wälti 2004: 603). In contrast, other scholars found the following three advantages of federal political systems compared to unitary ones (for an overview see Nice 1987; Adler 2005: 139–157): first, fragmented responsibilities and duplicities do not have to result in delays or races to the bottom. They may also trigger experimentation, mutual learning and a positive competition (or a race to the top) by

diffusing policy innovations between sub-national entities (Kloepfer 2004: 761; Chappell and Curtin 2012; Millimet 2013). Second, functionalist and economic approaches (in particular, the fiscal federalism approach) emphasise that regional autonomy can enhance the flexibility and the fine-tuning of federal policies to regional specifics (Keman 2000; Adler 2005; Jahn and Wälti 2007: 263). Finally, federalism can bring policy-making closer to the citizens and thereby improve the acceptance of governmental decisions (Millimet 2013: 34).

Obviously, a federal political system has the potential to both facilitate and hinder climate change mitigation, and examples such as the USA (see “[introduction](#)”) and Austria (Steurer and Clar 2015) illustrate that both can be found in reality. But can the findings on Austria be replicated for Switzerland? A key to assess the effects of federalism on climate policy-making is whether the federal polity set-up resulted in mutual learning and autonomous policy diffusion rendering federal coordination obsolete, or rather in delayed and/or watered-down policies, triggered inter alia through federal coordination. Consequently, we will pay close attention to who the main actors were in greening cantonal building policies. If federal (or even EU) interventions played a key role in triggering policy changes, federalism can be interpreted as a hindering factor that could only be overcome via coordination from the top. Before we can analyse our empirical material accordingly, we have to introduce climate policy integration as the dependent variable of our case study.

As most industrialised countries, Switzerland struggled with implementing effective mitigation policies, inter alia because it requires often disputed policy changes in many sectors at all levels of government (Bartle and Vass 2007: 39). Building on the concept of environmental policy integration (short EPI; Lafferty and Hovden 2003; Jordan and Lenschow 2010), this challenge is often referred to as climate policy integration (CPI). While the ultimate purpose of CPI regarding mitigation is to reduce carbon emissions (also referred to as “CPI as outcome”),² the concept is also concerned with the procedural aspects of integration (“CPI as governance”), and the policy instruments implemented to meet these ends (“CPI as output”) (Kok and de Coninck 2007; Adelle and Russel 2013). Usually, CPI as governance (e.g. through coordination and negotiation) leads to CPI as output (in the form of laws, subsidies or taxes) that (aim to) curb greenhouse gas emissions (Adelle and Russel 2013). According to the environmental and climate policy integration literatures, the integration of environmental or climate concerns into non-environmental sectors depends on all the factors that shape policy-making in general. To put highly complex policy processes in simple terms, CPI as outcome (or CO₂ emission cuts) depends, inter alia, not only on effective policy mixes (or on CPI as output) and on adequate governance arrangements that facilitate coordination between all relevant actors (or on CPI as governance). CPI as outcome also depends on polity issues such as ministerial and federal structures (i.e. on who is responsible for what), on sectoral actors and their (mutual or conflicting) interests (i.e. on who wants what) and on resources, capacities and power relations (i.e. on who can do what) (Lafferty and Hovden 2003; Jordan and Lenschow 2008, 2010; Adelle and Russel 2013).

Obviously, the key challenge of CPI in any state setting is to integrate climate concerns into other (non-environmental) sectors at the same level of government. However, as our case studies demonstrate, federal countries such as Switzerland (where the federal government shares mitigation-relevant competences with 26 cantons) or Austria (Steurer and

² Note that CPI as outcome in the context of climate change adaptation is concerned with reducing vulnerabilities and enhancing resilience.

Clar 2015), add a vertical dimension to this horizontal challenge, with all the potential pros and cons briefly reviewed above. Thus, the present paper analyses not only how cantons have integrated climate change mitigation concerns horizontally into their building policies but also what role vertical interactions between federal and cantonal actors played in this regard. In addition, we are also interested in how cantons coordinated their building policies among each other. Since this usually takes place prior to or as part of vertical interactions with federal actors, we address it in this context. To better understand these vertical interactions, the subsequent empirical section first introduces some relevant features of the Swiss federal system and then focuses mainly on CPI as governance and respective outputs.

“Constant federal dripping wears cantonal stones”: case study findings

According to the Kyoto Protocol, the Swiss federal government had to cut its greenhouse gas emissions by 8 % for the 2008–2012 period compared to 1990. By 2012, Switzerland achieved a 6 % reduction in carbon-equivalent emissions, and through the purchase of foreign emission certificates and the consideration of the carbon sink effects of forests, Switzerland was able to surpass its Kyoto target by 1 % (BAFU 2013, 2014). Domestic reductions were achieved due to the 2008–2010 economic recession, to a succession of warmer winters that required less energy for heating (UVEK 2011; BAFU 2013), and also through a number of climate change mitigation policies. Interestingly, emissions from the sub-nationally governed building sector fell by about 15 % during 2008–2012 compared to 1990 levels, despite an increase in heated building space of 35 % since 1990 (BAFU 2015). In line with the US example (see introduction) and a similarly positive development in the Austrian building sector (Steurer and Clar 2015), the face value of this performance suggests that, in contradiction to large parts of the environmental federalism literature (see previous section), federal political systems are well suited to address global problems such as climate change mitigation after all, whether the national government is committed to emission reduction targets or not. As we did for Austria (Steurer and Clar 2015), we now scratch the surface of this impression by diving into the nitty-gritty of Swiss federalism in greening the decentralised building sector.

What are the key aspects of the Swiss political system relevant for our case study (for a simplified overview of the main actors, see Fig. 1)? The Cabinet of the Swiss federal government, the so-called Federal Council, is the key actor behind horizontal policy integration at the federal level. It aims to integrate all departmental activities into a Legislature Plan. Based on this plan, legislative proposals are tabled by the Federal Council. Several permanent and ad hoc Conferences and working groups ensure that relevant sectoral (and cantonal) interests are considered. Dominated by federal policy-makers, this formal process is open to informal networks of cantonal authorities, special interest and civil society groups (Wälti 1996: 10; Braun 2003; Vatter and Wälti 2003: 15; Vatter 2004: 86). These often play an important role in Switzerland, inter alia because policy communities are relatively small (Sager et al. 2014: 355). The key actor for environmental issues in Switzerland is, as in most countries, the Department dealing with environmental affairs.³

³ The Federal Department of Environment, Transport, Energy and Communications, from now on short Environment Department.

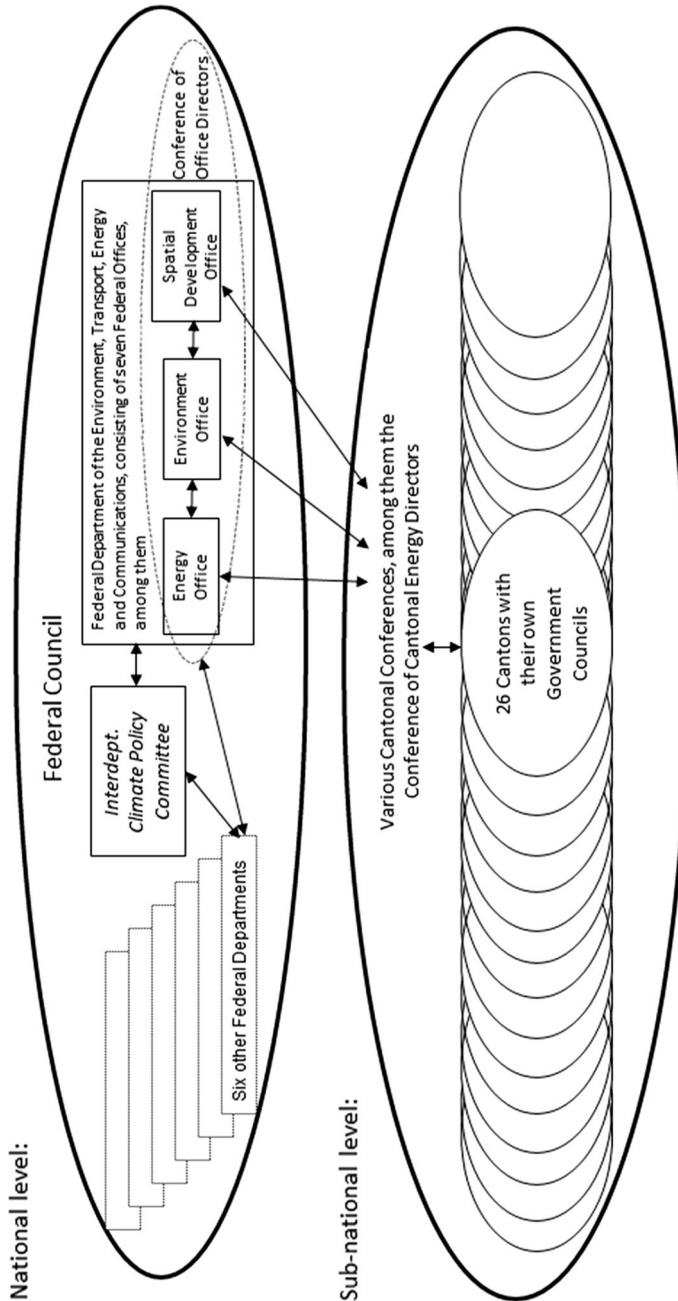


Fig. 1 Main actors relevant to CPI in the Swiss building sector

At the cantonal level, horizontal integration follows a similar pattern of formal and informal negotiations (Fleiner 2009: 52): each Swiss canton has collegial executive bodies that negotiate policies with sectoral, communal and civil society organisations (Mueller

2014). However, as we show below, vertical interactions between the Federal Departments and cantonal building policy-makers are more important for advancing CPI in cantonal building policies than horizontal interactions within a canton.

To accommodate for these vertical interactions and those among cantonal governments, Switzerland relies on a “gigantic infrastructure” (Tschäni 1987: 90) of coordination that aims to reconcile cantonal and federal interests (Bolleyer 2006: 8; Vatter 2008: 22; Füglistner 2012; Füglistner and Wasserfallen 2014). Because federal and cantonal governments share many responsibilities, one could even say that vertical interactions mark “business as usual” in Swiss policy-making (Fleiner 2009). While the federation often holds “the right to decide” (see the section “Federalism and policy integration”), the cantons often have “the right to act”, i.e. to implement federal policies (Wälti 1996; Freitag and Vatter 2002). Even in this form of “executive federalism” (Braun 2000; Swenden 2006), cantons have a large room to manoeuvre, mainly because few compliance mechanisms constrain them in “adjusting” implementation as they see fit (Klöti 2001: 21; Linder and Vatter 2001: 104). Regarding building policies, however, the cantonal room to manoeuvre is unrestricted because they have the rights to decide and to act on building standards and building subsidy schemes (Strebel and Widmer 2012).⁴ Therefore, federal interventions in this policy field had not been as common as in other policy fields (Fischer et al. 2010)—at least not historically before the CPI challenge emerged (BFE 2011b).

In 2007, the Swiss federal government completed a constitutional reform and shifted vertical interactions towards jointly negotiated, goal-oriented federal-cantonal contracts (called “convention programmes”) that usually foresee co-financing (Fischer et al. 2010). These programmes are negotiated by various political and administrative Conferences that bring federal and cantonal authorities together (Linder and Vatter 2001: 105). For building policies, the relevant Conference is the Swiss Conference of Cantonal Energy Directors (in short, the Energy Conference). Before vertical negotiations kick off, the Conferences coordinate cantonal positions vis-à-vis the federal government. To ensure effectiveness, the Conferences have agenda-setting and monitoring powers in virtually all policy sectors, and decisions are taken under majority rule. In practice, however, decisions are usually unanimous non-binding prescriptions (Bolleyer 2006: 12) later turned into binding cantonal laws in order to avoid federal interventions (Vatter 1999; Armingeon 2000: 115; Bolleyer 2006).

The horizontal and vertical interactions characterised above build on a strong consensus-seeking political culture that “reaches down into every cantonal setting” (Kriesi and Jegen 2001: 276). Nevertheless, reaching common policy goals is often a tricky and time-consuming process that can entrench inefficiencies, dilute reform efforts and yield incremental changes (Germann 1996; Swenden 2006: 192; Ingold and Varone 2012: 336). In the past, cantonal heterogeneity sometimes enabled the Federal Council to adopt narrow federal legislation and even capture what used to be cantonal competences if problems persisted (Vatter 1999, 2004: 87; Bolleyer 2006: 14; Füglistner 2012). Thus, an effective coordination of positions became an increasingly important concern for cantons to limit federal influence (Füglistner and Wasserfallen 2014: 405).

Obviously, Swiss federalism underwent significant changes in recent years. Although Switzerland is not an EU Member, the European Union (EU) helped strengthening federal actors in some instances because the federal government transposes most EU regulations as a prerequisite for gaining access to the European Single Market. Since the transposed regulations are binding for all cantons, the “Europeanisation of Switzerland” effectively

⁴ See also <http://www.endk.ch/de/EnDK/Ziel-und-Zweck>, accessed 2 February 2016.

curbs Swiss federalism (OECD 2008; Linder 2013: 192). Let us now analyse how this federal polity set-up affected climate policy-making in Switzerland in general and in the building sector in particular.

Governance and policies on climate change mitigation in Switzerland

Swiss climate policy is mainly the responsibility of the Environment Department. Regarding CPI as governance, it coordinates goals and measures horizontally among its seven Offices (in particular, among the Federal Offices for the Environment, for Energy and for Spatial Development), with the other six federal Departments and their numerous Offices (UVEK 2011: 12) and vertically with the cantons and their Conferences (see the following subsection; for an illustration, see Fig. 1). For this purpose, the Environment Department (in particular, the Environment Office) relies on several own Conferences and working groups (Schenkel 2000: 172). In the past, they sometimes competed with the Interdepartmental Committee for Sustainable Development headed by the Office for Spatial Development (Remmel 2012: 4) and with other units from the Energy Office. This horizontal fragmentation of federal climate policy-making became increasingly

Table 1 Federal climate policies relevant to the building sector

Year	Policy	Instrument type	Relevant sectors	Lead actors
1990	Energy 2000 (1990–2000)	Strategy/programme	Energy, buildings	Energy Office (Department of Environment, Transport, Energy and Communications)
1997	Sustainable Development Strategy	Strategy	Energy, finance, buildings	Spatial Development Office (Department of Environment, Transport, Energy and Communications)
1999	Carbon Act I (2000–2010)	Law foreseeing voluntary measures, carbon tax, emission-trading and subsidies	Industry, transport, buildings, finance	Environment Office (Department of Environment, Transport, Energy and Communications)
2000	SwissEnergy (2000–2010)	Programme	Energy, buildings, research	Energy Office (Department of Environment, Transport, Energy and Communications)
2005	Climate Penny (2005–2012)	Subsidy	Development cooperation, buildings	Climate Penny Foundation, then Energy and Environment Offices (Department of Environment, Transport, Energy and Communications)
2011	Carbon Act II (2011–2020)	Law foreseeing voluntary measures, carbon tax, emission-trading and subsidies	Industry, transport, buildings, energy, finance, agriculture, forestry, research	Environment Office (Department of Environment, Transport, Energy and Communications)

controversial, and some interest groups and cantons repeatedly criticised policy overlaps and contradictions, mainly in order to demand less ambitious climate policies (federal interviewee). As a result, the Environment Office set up an Interdepartmental Climate Policy Committee in 2008. The Committee involves the most relevant federal actors (i.e. 11 federal Offices from four Departments) and is open to other federal, cantonal and non-state experts. Although it acquired considerable competences, several federal and cantonal interviewees were sceptical about its effectiveness, *inter alia* because the Committee seems to favour economic interests. Thus, the Environment Office reinforced its engagement in existing horizontal integration mechanisms with other federal Departments and/or Offices (e.g. concerned with energy, transport, finance and economic issues) and alternative Conferences.

In terms of CPI as (envisaged or actual) policy output, the building sector always played an important role for federal actors. Although this sector is mainly in the hands of cantonal governments (see the introduction to this section), federal actors interfered repeatedly with their own policies addressing energy consumption also in households (see Tables 1, 4). In 1990, the Energy Office passed the Energy2000 action plan to stabilise that years' carbon emissions by 2000, a goal eventually reached but not necessarily due to the action plan (Casado-Asensio and Steurer 2014). In 1992, federal environmental, economic and fiscal units discussed a carbon tax (Schenkel et al. 1997; Knoefel 1997; Clivaz 2001: 33), but it was never adopted because businesses feared losing competitiveness (Ingold 2010). In 1995, the Environment Office drafted a Carbon Act in close cooperation with businesses (Ingold 2011). To increase the visibility and legitimacy of the Draft Act, the Environment Office included it in the first sustainable development strategy of 1997 (Schenkel 2000: 171). Notwithstanding this, climate and sustainability policy-making followed different paths (Remmel 2012: 12): while sustainable development remained a long-term vision, climate policy-making became concrete in the short term.

In 1999, the Swiss Parliament approved the Carbon Act for a 10-year period. Surpassing the Swiss Kyoto target (8 %), this “worldwide rather outstanding” piece of legislation at that time (Kumbaroglu and Madlener 2003: 194) intended to reduce carbon emissions by 10 % by 2010 compared to 1990. The Act foresaw two successive tracks, both managed by the Environment Office (Ingold 2010: 45) and covering the main emitting sectors (transport, buildings, industry). The first track consisted of voluntary measures for all three key sectors, notably through the SwissEnergy programme (Ingold 2007: 53, see also the following subsection), and the introduction of two emissions reductions targets: 15 % for heating and 8 % for motor fuel emissions by 2010 compared to 1990.⁵ It also envisaged a green fiscal reform and an emission-trading scheme. The second track (to be introduced only if the first track failed to deliver) foresaw a carbon tax on fossil motor and heating fuels (max. USD 230⁶ per t/CO₂), earmarked to finance building retrofitting (see the following subsection). In 2001, it became evident that voluntary measures were insufficient, but the Finance Department rejected the green fiscal reform (foreseen in the first track) and the second track altogether (Ingold 2010: 46). To solve this impasse, the

⁵ The SwissEnergy programme also aimed to cut carbon emissions by 10 per cent between 2000 and 2010 (baseline 1990), to ensure that total electricity consumption during the same period did not increase by more than 5 per cent and to increase the proportion of renewable energy as a share of overall energy supply in Switzerland (see also Sager et al. 2014).

⁶ All USD amounts in this paper were calculated by the authors based on the exchange rates applicable at the time of approval of the relevant piece of legislation or publication of document.

Economy Department⁷ supported the introduction of a Climate Penny for motor fuels. In 2005, the Swiss Parliament introduced the Penny despite opposition from the Environment and Energy Offices and taxed a litre of fuel with approx. one US cent. The revenues, administered by a newly created private body (the Climate Penny Foundation), were used to subsidise building retrofitting (see the following subsection) and purchase emission certificates (Schäfer 2009: 692).

Since the Penny Foundation scheme posed legal problems (a private entity was collecting a tax that had not gone through a referendum) and proved to be insufficient in curbing transport-related emissions, negotiations on a carbon tax started after all (Ingold 2010: 52). In 2007, they resulted in the introduction of a heating fuel tax (starting at USD 13 per t/CO₂; raised to USD 40 in 2010) and a national emissions trading system for the Swiss industry (BAFU 2007).

In 2009, the Energy and Environment Offices agreed to renew the Penny, and in 2011, the Carbon Act was also renewed. In line with EU objectives, Switzerland pledged to reduce carbon emissions by 20 % until 2020 (baseline 1990). The renewed Act triggered a few new measures in additional sectors, raised the carbon tax (max. USD 133 per t/CO₂ by 2020) and replaced the building retrofitting programme of the Penny Foundation with reinforced federal-cantonal collaboration (see the following subsection). In exchange for being excluded from the tax, transport emissions were regulated through the renewed Climate Penny, voluntary agreements and projects.

This brief history of often controversial and sluggish CPI as governance and as policy output in the Swiss federal government partly explains the failure to reach the Kyoto target with domestic measures. The moderate carbon tax that excluded the transport sector was particularly insufficient to curb greenhouse gas emissions caused by transportation and buildings (Ingold 2011). By focusing on CPI in the decentralised building sector, we now explore how the horizontal and vertical dimensions of policy integration played out in a federal state setting.

Federal and cantonal climate policies in the building sector

As shown in the introduction, building policies play a key role in mitigating greenhouse gas emissions, in particular in temperate regions such as Switzerland. The two main building policy options are tightening energy efficiency standards for new buildings and promoting the thermal retrofitting of old buildings (Metz 2010: 185). Swiss policy-makers pursued both options since the early 1990 s in order to meet the 1999 Carbon Act's goal to cut heating fuel emissions by 15 % until 2010 compared to 1990. During 2008–2012, the target was surpassed by almost 5 %, albeit also due to non-political drivers (for a discussion see the final section). This renders the new emission reduction target for the building sector according to the Climate Act 2011 (22 % by 2015 compared to 1990), within easy reach. To better understand the driving forces behind this emission decline and the role of Swiss federalism, this section analyses CPI governing processes (mainly vertical) and the interactions between relevant federal and cantonal policy outputs for the period 1990–2012.

⁷ Formally, this is the Secretariat for Economic Affairs.

Improving energy efficiency standards for buildings

Since the cantons have the right to decide and to act in building policy-making, a patchwork of strongly diverging regulatory frameworks emerged across Switzerland that ranged from comparatively environmental friendly regimes in a few pioneer cantons (Basel-Landschaft, Basel-Stadt, Bern and Zurich) to historically grown regimes that ignored calls for energy efficiency for a long time in most other cantons. Although inter-cantonal coordination of energy policies existed since 1979 and the Federal Council developed non-binding energy prescriptions for new buildings in the 1980s (BFE 2005a, b), these initiatives were not able to improve the energy efficiency of the Swiss building sector (Braun 2003; BFE 2011a: 33). The situation changed in 1990 when energy policy competences were broadly enshrined in the Swiss Constitution and federal actors stepped up their interventions in cantonal building policies since then.

In 1992, the federal Energy Office passed a building retrofitting initiative (see next subsection), and it facilitated a non-binding ordinance on nationwide building energy standards (“Model Ordinance for Rational Energy Use in Civil Engineering” of 1992; see Strebel 2011: 467). However, as various federal-level interviewees declared, most cantons were sceptical: while some stopped attending Conference meetings, most others rejected the Ordinance because they opposed any kind of federal intervention in cantonal responsibilities. Since front-running cantons (such as Bern and Basel-Stadt) improved their energy standards on their own and took advantage of the federal programme (see Sect. “[The energy efficiency pioneers Basel-Landschaft, Basel-Stadt and Bern](#)”), cross-cantonal regulatory differences even widened.

In 1998, a federal Energy Act clarified the repeatedly contested distribution of responsibilities for energy policies (BFE 2011a: 36). Concerning building policies, the Act confirmed that cantons set and implement the energy standards for old and new buildings and regulate the use of renewable and non-renewable energies for heating and hot water. However, it also enabled the federal government to further step up its interventions, e.g. by passing energy framework legislation, to consult and monitor cantons concerning energy issues and to support cantonal building policies with federal subsidies and goal-based global contributions (Strebel and Widmer 2012: 394). As we shown below, federal actors put this option into practice immediately.

The Energy Act from 1998 also rendered inter-cantonal coordination obligatory, and it gave the Energy Conference (driven at the time by cantons pioneering energy efficiency, see Sect. “[What about emission reductions – or CPI as outcome?](#)”) together with the Swiss Association for Architects and Engineers an open mandate to negotiate new cantonal “model prescriptions” on energy efficiency (MuKEN; see also Sager et al. 2014). Although not legally binding, the basic MuKEN⁸ module of 2000 improved the energy standards of new and retrofitted buildings considerably, but still at relatively unambitious levels (BFE 2005a, 2011a; Strebel and Widmer 2012; for an overview see Table 2 below). More ambitious optional MuKEN modules were adopted to give more advanced cantons the possibility to guide others in going beyond the basic prescriptions, but this rarely happened (cantonal interviewee).⁹ Although the MuKEN recommended transposition by 2003, the

⁸ MuKEN stands for “Mustervorschriften der Kantone im Energiebereich”—cantonal model prescriptions in the energy area.

⁹ These modules recommended an 80 % cap for the use of non-renewable energy in heating, aimed to limit the use of electric resistance heaters, and they adopted the privately developed 1998 MINERGIE label for low-energy buildings.

Table 2 The evolution of cantonal energy standards for new and retrofitted buildings

Type of instrument and agreement	Policy instrument	Maximum energy use of new buildings (in kWh/m ²)	Maximum energy use of retrofitted buildings (in kWh/m ²)
Voluntary policy guidance agreed between all cantons	Model Ordinance for Rational Energy Use in Civil Engineering (1992)	150	n/a
	MuKE n—Cantonal Model of Energy Prescriptions (2000)	82	120
	MuKE n—Cantonal Model of Energy Prescriptions (2008)	48	82
Voluntary label developed by a few cantons (open to all)	MINERGIE (1998)	42	n/a
	MINERGIE-Plus (2001)	38	n/a

Source: EnDK 2011

implementation of the basic module was slower because it required new cantonal legislation and referenda.¹⁰ In addition, differences persisted because cantons transposed modules differently (BFE 2005a, b) so that harmonisation across cantons was again hampered (Sager et al. 2014).

Overall, the cantonal “model prescriptions” on energy efficiency and the federal intervention possibilities represent first breakthroughs in the vertical integration of the hitherto highly fragmented Swiss building policy field. Nevertheless, the 2002 EU Energy Efficiency of Buildings Directive (binding for Switzerland) and the 2006 EU Action Plan for Energy Efficiency quickly rendered the improved Swiss standards obsolete. Arguing that inter-cantonal harmonisation was not capable of developing nationwide standards that could meet EU requirements fast enough, the federal government threatened to co-opt additional cantonal energy competences (BFE 2011a: 38) if the cantons did not make significant headway in this regard (Sager et al. 2014: 357; federal and cantonal interviews). Against this background, the cantons agreed to improve their standards faster and more stringently than with the MuKE n 2000 and a new round of Conference negotiations started in 2007 (Ingold 2010, 2011). In 2008, an update of the MuKE n was passed by the Energy Conference 2 years ahead of what was originally planned, to be implemented by 2010. Apart from 50 % stricter building standards (see Table 2), the basic module of the new MuKE n also included an energy label for buildings (consistent with EU requirements and with the revised and more stringent passive house standard MiNERGIE-Plus 2001), a mandatory target for non-renewable energy use that was optional under the MuKE n 2000, prescriptions for large consumers and a prohibition of electric resistance heaters (EnDK 2008). To empower the new MuKE n standards, the federal Energy Act was revised in 2009, effectively giving more legal weight to the inter-cantonal agreement. Although it is too early to evaluate the new MuKE n because cantons finalised implementation shortly

¹⁰ In 2003, 15 of the 26 cantons had implemented the basic module and 8 other modules. By 2007, the respective figures were 25 and 16 (BFE 2003, 2008).

before the end of this study, policy-makers expect the impact to be substantial (BFE 2011a; Sager et al. 2014).

For this subsection, we conclude that inter-cantonal disagreement on building standards slowed the harmonisation process aiming for CPI as output and that federal as well as EU interventions were necessary to bring about noteworthy policy changes.

Retrofitting programmes

As with setting building standards, promoting retrofitting was originally the sole responsibility of the cantons, but only the few energy efficiency pioneers introduced respective programmes early on (see the following subsection). Thus, the constitutional reform of 1990 prepared the ground for a more active role of the federal government also in this area (BFE 2011a). The Energy 2000 action plan negotiated by the federal Energy Office and the Energy Conference, for example, included not only new building standards (see above); it also aimed to promote the retrofitting of buildings by providing federal subsidies. Since federal funds had to be matched with cantonal subsidies, the pioneer cantons modified their own retrofitting programmes in line with federal requirements, and only a few others launched new ones (Basel-Landschaft, Fribourg, Lucerne, St Gallen). While evaluations show that federal funds had accelerated retrofitting in participating cantons, the majority showed no interest in the federal programme (BFE 2011a).

Based upon the Energy Act of 1998, the Energy Office replaced Energy 2000 with the broader Swiss Energy programme (“EnergieSchweiz”) in the year 2000. Among other things, it continued to co-finance retrofitting programmes in cantons that were willing to adopt at least the MuKE 2000 standards for retrofitted buildings until a new programme was established. SwissEnergy also promoted policy learning and community building among cantonal and federal authorities, and it helped to negotiate so-called convention programmes that were essentially “contracts” between federal and cantonal authorities on goals, metrics and activities to be implemented in exchange for co-financing (Sager et al. 2014). SwissEnergy also strengthened vertical integration and trust between federal and cantonal policy-makers, inter alia by increasing the involvement of the federal Energy Office in the Energy Conference (cantonal interviewees). Subsequently, the Energy Office monitored the implementation of these retrofitting programmes in order to name and shame participating cantons depending on their levels of activity which were determined through regular visits and cantonal self-assessment reports. However, Swiss federalism also complicated this endeavour: since no agreement was reached on the structure and contents of cantonal self-assessments, reports were so unreliable that some laggard cantons suddenly appeared to be among the frontrunners (BFE 2008; federal interviewees). Although participation in the programme was voluntary and 10 of the 26 cantons remained inactive (Strebel 2011: 471), energy savings triggered by SwissEnergy have been self-assessed to be USD 1.55 billion between 2000 and 2005 (BFE 2008). As one of our interviewees noted, the greenhouse gas emission reductions in the programme are unknown, mainly because its focus was energy security rather than climate change (at least until the mid-2000s).

In 2005, the Climate Penny Foundation launched another Buildings Programme that initially competed with SwissEnergy (BFE 2008: 25; federal interviewee). In order to avoid redundancies, the federal government first reduced the scope of SwissEnergy (BFE 2005a, b: 9), and 5 years later, it merged the Foundation’s Programme with the mainly informational “buildings track” of SwissEnergy. Co-led by the Environment and Energy Offices in cooperation with the Energy Conference, the programme aims to promote

Table 3 Annual funds for the national part of the buildings programme (in million USD)

	2010	2011	2012	2013	Sums 2010–2013
(a) Federal funds available	227	257	182	135	801
(b) Federal funds spent	25	150	192	147	514
(c) Cantonal funds spent:	76	83	91	140	390
(d) Total funds spent (b and c)	101	233	283	287	904
(e) Full potential and ratio of funds spent	454	514	364	270	1602
	22 %	45 %	78 %	106 %	56 %

Source: EnDK 2010, 2011, 2012, 2013, own calculations (line e and column “Sums 2010–2013”)

building retrofitting and the modernisation of heating systems through subsidies provided by federal and cantonal authorities in equal shares and negotiated in so-called convention programmes.

While the effects of the merged Buildings Programme on retrofitting rates and carbon emissions are unclear (federal interviewee), its potential and actual outputs are known. Since these details are relevant to answering our research question, we have to briefly review them. As Table 3 shows, the total funds spent increased from USD 101 million to USD 287 million between 2010 and 2013 (see line d in Table 3), but this improvement cannot hide the fact that the cantons exploited only 56 % of the programmes’ full potential (line e). What were the reasons for this underperformance? In the first two years, federal funds retrieved by the cantons (line b) fell considerably short compared to the federal funds available through carbon tax revenues (line a) and so did the funds spent by the cantons themselves (line c). According to cantonal and federal interviewees, cantons found the conditions to receive federal funding too demanding and often failed to obtain federal funds. Once federal authorities found out about this in 2011, they eased the conditions swiftly. This led to a further increase in federal and cantonal funds spent in 2012 (EnDK 2011: 17, 2012, 2013), but cantons still lagged far behind the agreed 50:50 co-funding ratio. Only in its fourth year (2013), the cantons were able to tap the full potential of the Buildings Programme with the appropriate co-funding ratio.

Obviously, the Swiss federal government was the main driver and Swiss federalism the main obstacle for unleashing the full potential of building retrofitting since 2010. While the Buildings Programme represents a federal intervention in a predominantly cantonal policy field, the figures summarised in Table 3 show that cantonal funding (line c) persistently lagged behind federal funding (line b) and even more so behind federal funding potentials (line a). Although the programme could have been almost twice as large (line e), federal funds were at least able to mobilise some cantonal funds for building retrofitting.

So far, it seems that CPI in cantonal building standards and retrofitting schemes hinged mainly on federal interventions, but what about the pioneer cantons? In how far were they ahead of federal interventions and, more importantly, able to stimulate mutual learning and a positive competition among cantons (a key argument in favour of federal political systems, see Sect. “Federalism and policy integration”)?

The energy efficiency pioneers Basel-Landschaft, Basel-Stadt and Bern

The pioneering status of Basel-Landschaft, Basel-Stadt and Bern has a history that predates climate change concerns. It can be traced back to the oil shock of the 1970s, aggravated by

the cantonal rejection of nuclear energy as an alternative to fossil fuels.¹¹ The untypical anti-nuclear legacy of all three cantons (about 40 % of electricity in Switzerland is produced by four nuclear power plants) forced them to focus upon energy efficiency and renewable energy in the building sector already in the 1970s. This led to relatively large and experienced energy units that maintained tight connections to professional associations (BFE 2008, 2011a: 125, b). In addition, these units were part of overall well-developed semi-autonomous administrative systems with a relatively strong and autonomous technical, organisational, professional and financial status (Wälti 1996: 11; Vatter 2004: 87).¹²

When federal and cantonal governments began negotiating CPI into cantonal building policies in the late 1990s (see above), the three cantons had an edge over others, and the Swiss federal system allowed them to keep it. As Fig. 2 shows, with the exception of Bernese standards for old buildings the three cantons consistently surpassed nationwide building standards. In addition, they also adopted carbon emission and/or energy efficiency targets for the building sector.¹³ On this basis, the three cantons also advocated for higher nationwide standards in the Energy Conference, for example by exemplifying that their competitiveness had not been hurt (BFE 2011b: 24–38).¹⁴ However, they did not succeed in significantly improving other cantonal building standards and remain pioneers until today (Strebel and Widmer 2012: 392).¹⁵

The standard-setting picture can be replicated for subsidy programmes: Basel-Stadt and Bern established them long before the launch of federal interventions (in 1986 and 1981, respectively). Only Basel-Landschaft adopted its 1994 programme in response to Energy 2000 and improved it concurrently with federal programmes. Between 2000 and 2005, the programmes of Basel-Landschaft and Bern corresponded with the Swiss average (around USD 9 per capita annually), and thereafter, they consistently surpassed the average (BFE surveys conducted from 2006 to 2013). Basel-Stadt had by far the largest programme for many years (ranging from USD 229–341 per capita annually in the 2000–2005 period, financed by an incentive penny and a tax on electricity consumption; BFE 2009, 2011a), with a shrinking tendency (USD 95 per capita in 2010 and USD 74 per capita in 2012; BFE 2011a, 2013).¹⁶ In sum, we see that promotions for energy-efficient buildings in the three

¹¹ Prompted by strong anti-nuclear movements and the fact that nuclear power plants in other Swiss cantons surround Basel-Landschaft and Basel-Stadt, the “twin cantons” enshrined a constitutional ban on the production and use of nuclear energy in 1984 and 1985, respectively. In Bern, public opinion prevented the cantonal government to expand the capacity of its nuclear power plant, and in 2006, the canton agreed to shut it down. This was 5 years before the federal government took the same decision for entire Switzerland (see <http://www.bfe.admin.ch/themen/00511/index.html?lang=de>; accessed on 19 February 2015).

¹² In contrast, structurally weak cantons (such as Obwalden, Solothurn or Valais) often lack the necessary expertise to judge drafts or to adopt federal legislation (Linder and Vatter 2001: 103).

¹³ Basel-Landschaft aims to reduce its building emissions (baseline 2000) by 5 per cent until 2015 (Energie Strategie Basel-Landschaft 2008). Basel-Stadt aims to cut the energy use of buildings by 25 per cent until 2035 compared to 2000 (Energiekonzept Basel-Stadt 2035). Bern aims to reduce both sectoral carbon emissions by 10 per cent until 2020 compared to 2003 (Energie Report Bern 2003) and energy use in heating by 20 per cent until 2035, baseline 2005 (Energie Strategie Bern 2006).

¹⁴ Bern, for example, diffused the MINERGIE standard for new buildings to the MuKE 2000; Basel-Landschaft and Basel-Stadt diffused the MINERGIE-Plus standard for new and retrofitted buildings in the optional module of the MuKE 2008.

¹⁵ Basel-Landschaft and Basel-Stadt, for example, failed to spread the so-called Basel way (i.e. to render the optional module of the MuKE 2000 obligatory and a stricter requirement for the new central module under the MuKE 2008), because other cantons regarded it as being too restrictive (BFE 2011c: 129).

¹⁶ In per capita terms, no consolidated figures exist. However, the latest figures available show that the Swiss average was around USD 16 per inhabitant in 2012. In Basel-Stadt, it was USD 74, whereas in Basel-Landschaft it was about USD 25 and Bern USD 17 in 2012 (BFE 2013).

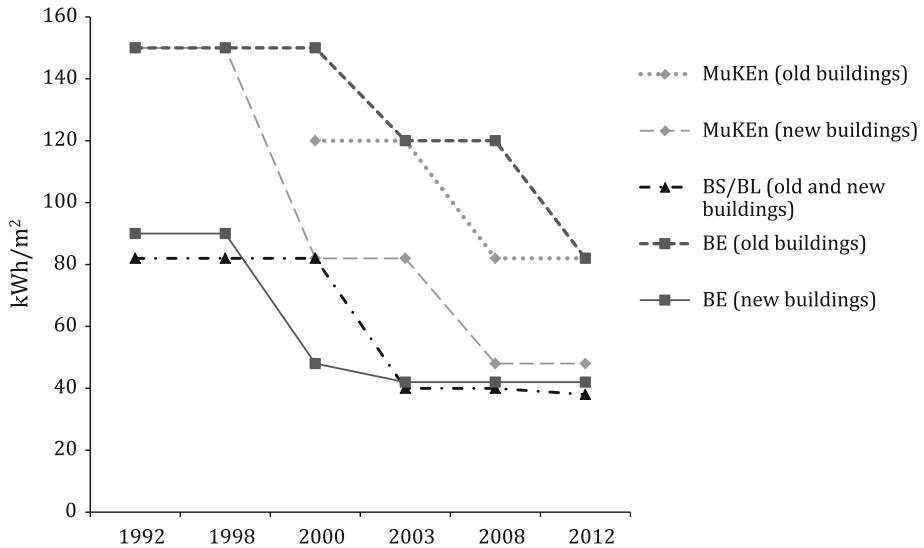


Fig. 2 Evolution of national and cantonal energy standards for new and retrofitted buildings in Basel-Landschaft, Basel-Stadt and Bern (in kWh/m²). *Source:* Own illustration based on data from BFE (2005b, 2008, 2011b)

pioneer cantons predated and/or swiftly grew above average in response to federal programmes (BFE 2008, 2011a, 2011b).

Negotiations on federal co-funding were usually easy for the three cantons because of their high standards and because they had good relations with the Energy Office. However, even for them implementing the Buildings Programme that promoted the MuKen 2008 proved challenging. Officials from Basel-Landschaft and Basel-Stadt criticised unnecessary and constraining administrative and procedural requirements. While Basel-Landschaft promoted the Programme vigorously (EnDK 2010: 14, 2011, 2012), Basel-Stadt switched to own retrofitting programmes because, as one of the interviewees remarked, the Environment Office “changed the administrative and technical procedures regulating access to subsidies” sometimes “arbitrarily”. Finally, the canton of Bern valued the “multiplier effect of the Programme and the possibility to pursue its own objectives through it” (interviewee from Bern). It negotiated the most ambitious retrofitting programme of Switzerland. This would not have been possible without federal support because a referendum on a cantonal energy tax (supposed to finance building retrofitting) failed in 2008.

Overall, all three pioneer cantons benefitted from federal support for their subsidy programmes, and all three played driving roles in successive rounds of inter-cantonal coordination—but usually only after they were triggered by federal interventions. Nevertheless, the three pioneers were largely unable to diffuse their ambitious standards and promotion schemes to other cantons on their own. Since the pioneers were helpful as soon as federal interventions began but did not render them obsolete at the outset, we conclude that Swiss federalism empowered a few pioneers but did not trigger mutual learning and a positive competition towards CPI among cantons, let alone a race to the top.

Table 4 Linkages between federal and cantonal policies related to building standards

Federal policies	Cantonal policies				
	Model Ordinance for Rational Energy Use (1992)	MINERGIE (1998)	MuKE n (2000)	MINERGIE-Plus (2001)	MuKE n (2008)
Constitutional reform (1990)	Facilitated adoption				
Energy2000 (1990–2000)	Facilitated implementation		Facilitated adoption		
Energy Act 1998			Facilitated adoption		Facilitated adoption
Carbon Act I (2000–2010)		Facilitated implementation			Facilitated adoption
SwissEnergy (2000–2010)		Facilitated implementation	Facilitated implementation		Facilitated implementation
Carbon Act II (2011–2020)				Facilitated implementation	Facilitated implementation

What about emission reductions—or CPI as outcome?

So far, we were mainly concerned with CPI as governance and as policy output. We now complete the empirical section by briefly discussing CPI as outcome. In how far did the policy changes analysed here contribute to the decline of greenhouse gas emissions in the building sector by 15 % during 2008–2012 compared to 1990 levels (BAFU 2015)? Unfortunately, Swiss federalism stands not only in the way of CPI as cantonal policy output. It also hinders the gathering of reliable and comparable data necessary to answer this question. Although most cantons do not maintain emission inventories (federal and cantonal interviewees), federal Offices have estimated the effects of their interventions as follows: improved energy efficiency standards (MuKE) decreased the energy use in new buildings by 4 % and in old buildings by 16 % between 2000 and 2007 (EnDK 2008: 35). Annual retrofitting rates are estimated to range between 0.8 and 2 % (Jakob and Eberhard 2004; UVEK 2012; Ott 2013). Despite the fact that these figures are rough estimates, federal and cantonal policies certainly explain parts of the positive trend in the building sector, but the oil price surge after 2008 in combination with technological progress and a tendency towards mild winters also played significant roles (for a similar but more detailed interpretation for Austria, see Steurer and Clar 2015). However, the declining emissions trend can be explained, and it does not affect our main conclusions regarding the role federalism played in greening building policies across Switzerland.

Concluding discussion

This concluding discussion distils from the rich empirical material presented above how Swiss federalism has hindered rather than facilitated CPI in building policies and what lessons and recommendations we can draw from this. Building upon the introductory and conceptual sections, we focus our discussion on actor constellations, CPI as governance arrangements, and the origin and nature of CPI as policy outputs.

Regarding actor constellations, we have seen repeatedly that federal actors were the main drivers for decarbonising the building sector across Switzerland, despite the fact that they originally had relatively weak formal responsibilities compared to their cantonal counterparts. However, federal Environmental and Energy Offices sought to overcome cantonal fragmentation and sluggishness with constitutional reforms as a prerequisite for CPI as vertical governance and most prominently with CPI as federal policy interventions targeting cantonal building policies. The few cantonal pioneers in energy efficiency issues were helpful for federal actors when pushing CPI onto cantonal agendas, but they were unable to do this on their own.

In terms of CPI as governance, the key role the federal authorities played in a cantonal policy field entailed of course intense vertical coordination of federal and cantonal positions, mainly through the Energy Conference. As shown above, improvements in cantonal building standards and retrofitting schemes usually depended on federal coordination and policy interventions, with pioneers being the exceptions confirming this rule. Nevertheless, we must not overlook a lack of coordination between the federal Environmental and Energy Offices and their detrimental consequences for cantonal policies. This lack of horizontal coordination resulted in partly competitive federal interventions (see, e.g. SwissEnergy and the building programme of the Climate Penny Foundation) and subsequent changes which aimed to reduce redundancies. Unfortunately, both contributed to

creating a “bad chemistry”, in particular between federal and cantonal authorities. Against this background, it seems that federal interventions could have been even more effective if they were always well coordinated and coherent. Finally, progress in integrating mitigation concerns into cantonal building standards and retrofitting schemes also depended on inter-cantonal coordination in which pioneer cantons played important roles. However, even the coordination between cantons usually improved not autonomously but as a response to new demands coming from the federal (or EU) level.

In terms of CPI as policies, only a few pioneer cantons were ahead of federal interventions, while most others remained passive throughout our study period. Instead of learning from the few cantonal pioneers and engaging themselves autonomously and proactively with greening building policies, most cantons either ignored or at best slowly responded to federal interventions. Consequently, a highly complex web of interactions between federal and cantonal authorities and equally complex relations between their policies on building standards and retrofitting schemes emerged. Based on the empirics presented in the previous section, Table 4 summarises the linkages between federal and cantonal policies on building standards. It shows that the adoption or the implementation of all five cantonal policy changes can be linked to federal interventions. Not coincidentally, federal and cantonal governments were both very active between 1998 and 2001, shortly before Switzerland ratified the Kyoto Protocol in 2003.

Overall, our findings on actor constellations, CPI as governance and CPI as policy outputs do not point towards federalism facilitating mutual learning and a positive competition towards climate change mitigation unleashed by pioneer cantons. Instead, we found Swiss federalism responsible for incoherent and inadequate cantonal policies, delayed and watered-down policy changes that did not come from the cantons autonomously but that depended on complex interactions between federal and cantonal actors and policies. Obviously, these vertical interactions were necessary to overcome the obstacles Swiss federalism posed for greening cantonal building policies: if cantons were the main drivers behind CPI in the building sector, these interactions would not have been necessary. However, since federalism triggered neither a race to the top nor one to the bottom, the metaphor that summarises our findings best is federalism as “a multi-level steeplechase” that further complicated an already complex policy challenge (for a similar conclusion on Austria, see anonymised). Since a small country such as Switzerland does not require the fine-tuning of building standards to regional specifics, the obvious downsides of federalism were not balanced by the (potential) advantages of federalism as summarised in Sect. “[Federalism and policy integration](#)”.

What policy-relevant lessons and recommendations can we draw from our findings? First, our findings reiterate a lesson drawn from a similar case study on Austria. We caution “against high hopes assuming that decentralised or polycentric governance can fully compensate for failed international and national climate policies. Polycentric governance arrangements can certainly be effective, but according to our findings, decentralised policy-making is not necessarily the ideal way to solve global environmental problems” (Steurer and Clar 2015: 100)—in particular not when national actors have adopted a global mitigation accord such as the Kyoto Protocol without involving sub-national actors.

Second, the most obvious recommendation is to centralise responsibilities in federal countries that play a key role in solving global problems such as climate change mitigation—at least when national governments have adopted a commitment to curb greenhouse gas emissions (for the USA serving as a counterexample, see the introduction). While this recommendation is very unrealistic in other federal countries (for Austria, see Steurer and

Clar 2015), there is a small chance to further strengthen federal actors in Switzerland because its federal political system was repeatedly in flux in recent decades.

Third, a key obstacle for facilitating CPI in the decentralised building sector was that the federal government failed to pass on its national Kyoto commitment to its cantons. Consequently, Swiss Federalism detached the international obligation from vital cantonal policies on the ground, and a complex web of interactions was necessary to bridge this detachment. Consequently, federal governments should synchronise international (or European) and domestic effort sharing negotiations early on so that sub-national governments are obliged to meet own targets (Steurer and Clar 2015). The fact that not only Switzerland but all federal countries in Europe failed to do so until now reemphasises how lightly governments have taken climate change mitigation targets so far.

Acknowledgments We thank the Austrian Climate Research Programme (ACRP) for funding the CLIP-IN project (Project No. K10AC0K00054) that led to this article and the reviewers and editors from Policy Sciences for their comments and suggestions. Although some of them were excessive, they nevertheless helped us to improve the paper.

Open Access This article is distributed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made.

Appendix

See Table 5.

Table 5 List of interviews

Societal domain	Level of activity	Organisation	Location, date in 2013
Governmental	Federal	Federal Office for Spatial Development	Bern, 17 January
		Federal Department of the Environment, Transport, Energy and Communication	Bern, 17 January
		Conference of Cantonal Energy Directors	Zurich, 14 January
		Federal Finance Administration	Bern, 16 January
		Federal Office for the Environment	Bern, 15 & 16 January
		State Secretariat for Economic Affairs	Bern, 15 January
		Swiss Federal Office of Energy	Bern, 16 & 17 January
	Cantonal	Office for Environment and Energy, Bern	Bern, 15 January
		Office for Environmental Integration and Energy, Basel-Stadt	Basel, 18 January
		Office for Environmental Protection and Energy, Basel-Landschaft	Liestal, 18 January
Non-governmental	National	Swiss Business Federation (Economiesuisse)	Zurich, 14 January
		Scientific expert	Bern, 16 January
		World Wildlife Foundation (WWF)	Zurich, 14 January

References

- Adelle, C., & Russel, D. (2013). Climate Policy Integration: a Case of Déjà Vu? *Environmental Policy and Governance*, 23(1), 1–12.
- Adelman, D., & Engel, K. (2008). Adaptive federalism: The case against reallocating environmental regulatory authority. *Minnesota Law Review*, 92, 1796–1850.
- Adler, J. (2005). Jurisdictional mismatch in environmental federalism. *NYU Environmental Law Journal*, 14, 130–178.
- Armingeon, K. (2000). Swiss federalism in comparative perspective. In U. Wachtendorfer-Schmidt (Ed.), *Federalism and political performance* (pp. 112–129). London: Routledge.
- BAFU. (2013). *Klimaänderung in der Schweiz: Indikatoren zu Ursachen, Auswirkungen, Massnahmen*. Bern: BAFU.
- BAFU. (2014). *Switzerland's Greenhouse Gas Emissions*, Bern: BAFU. <http://www.bafu.admin.ch/klima/09570/index.html?lang=en>. Accessed 2 Feb 2016.
- BAFU. (2015). *Core Indicator Greenhouse Gas Emissions*, Bern: BAFU. <http://www.bafu.admin.ch/umwelt/indikatoren/08496/08619/index.html?lang=en>. Accessed 2 Feb 2016.
- BAFU (Bundesamt für Umwelt). (2007). *Klimaänderung in der Schweiz: Indikatoren zu Ursachen, Auswirkungen, Massnahmen*. Bern: BAFU.
- Bartle, I. & Vass, P. (2007). Climate change policy and the regulatory state—a better regulation perspective. *Bath School of Management Research Report No. 19*. Bath: University of Bath.
- BFE. (2005a). *Internationaler Vergleich von Energiestandards im Baubereich*. Bern: BFE.
- BFE. (2005b). *Stand der Energiepolitik in den Kantonen 05*. Bern: BFE.
- BFE. (2008). *Stand der Energiepolitik in den Kantonen 08*. Bern: BFE.
- BFE. (2009). *Globalbeiträge an die Kantone nach Art. 15 EnG: Wirkungsanalyse kantonaler Förderprogramme: Ergebnisse der Erhebung 2008*. Bern: BFE.
- BFE. (2011a). *Determinanten des Vollzugs energiepolitischer Massnahmen auf kantonaler Ebene*. Bern: BFE.
- BFE. (2011b). *Globalbeiträge an die Kantone nach Art. 15 EnG: Wirkungsanalyse kantonaler Förderprogramme: Ergebnisse der Erhebung 2010*. Bern: BFE.
- BFE. (2011c). *Stand der Energiepolitik in den Kantonen 11*. Bern: BFE.
- BFE. (2013). *Globalbeiträge an die Kantone nach Art. 15 EnG: Wirkungsanalyse kantonaler Förderprogramme: Ergebnisse der Erhebung 2012*. Bern: BFE.
- BFE. (Bundesamt für Energie). (2003). *Stand der Energiepolitik in den Kantonen 3*. Bern: BFE.
- Biela, J., Hennl, A., & Kaiser, A. (2012). Combining federalism and decentralization: comparative case studies on regional development policies in Switzerland, Austria, Denmark, and Ireland. *Comparative Political Studies*, 45(4), 447–476.
- Bolleyer, N. (2006). Consociationalism and intergovernmental relations—linking internal and external power-sharing in the Swiss Federal Polity. *Swiss Political Science Review*, 12(3), 1–34.
- Braun, D. (2000). Territorial division of power and public policy-making: An overview. In D. Braun (Ed.), *Public policy and federalism*. Aldershot: Ashgate.
- Braun, D. (2003). Dezentraler und unitarischer Föderalismus. Die Schweiz und Deutschland im Vergleich. *Swiss Political Science Review*, 9(1), 57–89.
- Casado-Asensio, J., & Steurer, R. (2014). Integrated strategies on sustainable development, climate change mitigation and adaptation in Western Europe: communication rather than coordination. *Journal of Public Policy*, 34(3), 437–473.
- Chappell, L., & Curtin, J. (2012). Does federalism matter? Evaluating state architecture and family and domestic violence policy in Australia and New Zealand. *Publius: The Journal of Federalism*, 43(1), 24–43.
- Clivaz, C. (2001). Influence des réseaux d'action publique sur le changement politique: l'exemple de l'écologisation des politiques suisses et valaisannes du tourisme, des transports et de l'agriculture. *Swiss Political Science Review*, 7(1), 19–50.
- Corfee-Morlot, J. (2009). *California in the greenhouse: regional climate change policies and the global environment*, PhD Dissertation, Geography Department. London: University College London.
- EnDK. (2010). *Geschäftsbericht 2010: Gebäudeprogramm Teil Gebäudehülle*. Bern: EnDK.
- EnDK. (2011). *Geschäftsbericht 2011: Gebäudeprogramm Teil Gebäudehülle (Teil A)*. Bern: EnDK.
- EnDK. (2012). *Geschäftsbericht 2012: Gebäudeprogramm Teil Gebäudehülle (Teil A)*. Bern: EnDK.
- EnDK. (2013). *Geschäftsbericht 2013: Gebäudeprogramm Teil Gebäudehülle (Teil A)*. Bern: EnDK.
- EnDK (Konferenz Kantonale Energiedirektoren). (2008). *Mustervorschriften der Kantone im Energiebereich*. Bern: EnDK.
- Esty, D. (1996). Revitalizing environmental federalism. *Michigan Law Review*, 95(3), 570–587.

- Fischer, M., Sciarini, P., & Traber, D. (2010). The silent reform of Swiss federalism: The new constitutional article on education. *Swiss Political Science Review*, 16(4), 747–771.
- Fleiner, T. (2009). The current situation of federalism in Switzerland. *REAF*, 9(1), 51–90.
- Freitag, M., & Vatter, A. (2002). Die Janusköpfigkeit von Verhandlungsdemokratien. Zur Wirkung von Konkordanz, direkter Demokratie und dezentralen Entscheidungsstrukturen auf den öffentlichen Sektor der Schweizer Kantone. *Swiss Political Science Review*, 8(2), 53–80.
- Füglister, K. (2012). Where does learning take place? The role of intergovernmental cooperation in policy diffusion. *European Journal of Political Research*, 51, 316–349.
- Füglister, K., & Wasserfallen, F. (2014). Swiss federalism in a changing environment. *Comparative European Politics*, 12(4/5), 404–421.
- Galarraga, I., Gonzalez-Eguino, M., & Markandya, A. (2011). The role of regional governments in climate change policy. *Environmental Policy and Governance*, 21(3), 164–182.
- Germann, R. (1996). *Administration publique en Suisse*. Berne: Haupt.
- Gordon, D., & Macdonald, D. (2014). Institutional strength, intergovernmental relations and national climate policy coordination: Australia and Canada compared. In I. Weibust & J. Meadowcroft (Eds.), *Multilevel environmental governance: managing water and climate change in Europe and North America* (pp. 154–180). Cheltenham: Edward Elgar.
- Goulder, L. and Stavins, R. (2010). Interactions between state and federal climate change policies, *Fondazione Eni Enrico Mattei Working Papers*, Paper No. 487.
- Ingold, K. (2007). The influence of actors' coalition on policy choice: The case of the Swiss Climate Policy. In T. Friemel (Ed.), *Applications of social network analysis* (pp. 120–143). Konstanz: UVK Verlagsgesellschaft.
- Ingold, K. (2010). Apprendre pour le futur: Une analyse de la politique climatique suisse. *Swiss Political Science Review*, 16(1), 43–76.
- Ingold, K. (2011). Network structures within policy processes: coalitions, power, and brokerage in swiss climate policy. *Policy Studies Journal*, 39(3), 435–459.
- Ingold, K., & Varone, F. (2012). Treating Policy Brokers Seriously: Evidence from the Climate Policy. *Journal of Public Administration Research and Theory*, 22(2), 319–346.
- Jahn, D., & Wälti, S. (2007). Umweltpolitik und Föderalismus: Zur Klärung eines ambivalenten Zusammenhangs. *Politische Vierteljahresschrift, Sonderheft*, 39(2007), 262–279.
- Jakob, M. & Eberhard, J. (2004). Erneuerungsverhalten im Bereich Wohngebäude, *Schweizerisches Status-Seminar Energie- und Umweltforschung im Bauwesen*, September 2004, ETH Zurich.
- Jordan, A., & Lenschow, A. (2008). *Innovation in Environmental Policy? Integrating the Environment for Sustainability*. London: Edward Elgar.
- Jordan, A., & Lenschow, A. (2010). Environmental policy integration: a state of the art review. *Environmental Policy and Governance*, 20(3), 147–158.
- Keman, H. (2000). Federalism and policy performance: a conceptual and empirical inquiry. In U. Wachendorfer-Schmidt (Ed.), *Federalism and political performance* (pp. 196–227). London: Routledge.
- Kloepfer, M. (2004). Föderalismusreform und Umweltrecht. *Natur und Recht, Heft*, 12, 759–764.
- Klöti, U. (2001). Consensual government in a heterogeneous polity. *West European Politics*, 24(2), 19–34.
- Knoepfel, P. (1997). Switzerland. In M. Jänicke & H. Weidner (Eds.), *National environmental policies: a comparative study of capacity-building* (pp. 175–197). Berlin: Springer.
- Kok, M., & de Coninck, H. (2007). Widening the scope of policies to address climate change: directions for mainstreaming. *Environmental Science & Policy*, 10(7–8), 587–599.
- Kriesi, H., & Jegen, M. (2001). The Swiss energy policy elite: The actor constellation of a policy domain in transition. *European Journal of Political Research*, 39(2), 251–287.
- Kumbaroglu, G., & Madlener, R. (2003). Energy and climate policy analysis with the hybrid bottom-up computable general equilibrium model SCREEN: the case of the Swiss CO2 act. *Annals of Operations Research*, 121, 181–203.
- Lafferty, W., & Hovden, E. (2003). Environmental policy integration: towards an analytical framework. *Environmental Politics*, 12(3), 1–22.
- Linder, W. (2013). Switzerland and the EU: the puzzling effects of Europeanisation without institutionalisation. *Contemporary Politics*, 19(2), 190–202.
- Linder, W., & Vatter, A. (2001). Institutions and outcomes of Swiss federalism: the role of the cantons in Swiss politics. *West European Politics*, 24(2), 95–122.
- Lutsey, N., & Sperling, D. (2008). America's bottom-up climate change mitigation policy. *Energy Policy*, 36(2), 673–685.

- Macey, J., & Butler, H. (1996). Externalities and the matching principle: the case for reallocating environmental regulatory authority, *Yale Law School Faculty Scholarship*, Paper 1447, Yale University, pp. 23–66.
- Metz, B. (2010). *Controlling climate change*. Cambridge: Cambridge University Press.
- Millimet, D. (2013). Environmental federalism: a survey of the empirical literature, *IZA Discussion Paper No. 7831*, Leibniz.
- Mueller, S. (2014). Shared rule in federal political systems: conceptual lessons from subnational Switzerland. *Publius: The Journal of Federalism*, 44(1), 82–108.
- Nice, D. (1987). *Federalism: the Politics of Intergovernmental Relations*. New York: Macmillan.
- OECD. (2008). *Switzerland: seizing the opportunities for growth*. Paris: OECD.
- Ott, W. (2013). Akteure und Sanierungsgeheimnisse: Überblick“, WWF Workshop: *Sanierungsrate Hochschrauben—aber wie?*, January 2013, Zurich.
- Peters, G. (1998). Managing horizontal government: the politics of co-ordination. *Public Administration*, 76(2), 295–311.
- Rabe, B. (2007). Beyond Kyoto: climate change policy in multilevel governance systems. *Governance*, 20(3), 423–444.
- Rommel, S. (2012). The Swiss NSDS and its integration into the National Legislative Program, *ESDN Case Study No. 9*. Vienna: European Sustainable Development Network.
- Robertson, D. (1985). *A dictionary of modern politics*. London: Europa Publications.
- Sager, F., Bürkiand, M., & Luginbühl, J. (2014). Can a policy program influence policy change? The case of the Swiss EnergieSchweiz program. *Energy Policy*, 74(2), 352–365.
- Schäfer, W. (2009). Some talk, no action (Yet): interdependence, domestic interests and hierarchical EU governance in climate policy. *Swiss Political Science Review*, 15(4), 683–713.
- Schenkel, W. (2000). From clean air to climate policy in the Netherlands and Switzerland: how two small states deal with a global problem. *Swiss Political Science Review*, 6(1), 159–184.
- Schenkel, W., Kux, S., & Marek, D. (1997). Subsidiarität und Luftreinhaltung in der Schweiz—aus internationaler, nationaler und lokaler Perspektive. *Swiss Political Science Review*, 3(3), 229–256.
- Steurer, R. (2003). The US’s retreat from the Kyoto Protocol: An account of a policy change and its implications for future climate policy. *European Environment*, 13(6), 344–360.
- Steurer, R., & Clar, C. (2015). Is decentralisation always good for climate change mitigation? How federalism has complicated the greening of building policies in Austria. *Policy Sciences*, 48(1), 85–107.
- Strebel, F. (2011). Inter-governmental institutions as promoters of energy policy diffusion in a federal setting. *Energy Policy*, 39, 467–476.
- Strebel, F., & Widmer, T. (2012). Visibility and facility in policy diffusion: going beyond the prevailing binarity. *Policy Sciences*, 45(2), 385–398.
- Swenden, W. (2006). *Federalism and regionalism in Western Europe: a comparative and thematic analysis*. New York: Palgrave Macmillan.
- Tschäni, H. (1987). *Wer regiert die Schweiz? Der Einfluss der Lobby und Verbände*. Piper: Munich.
- Tsebelis, G. (2002). *Veto players: how political institutions work*. Princeton: Princeton University Press.
- UVEK. (2012). *Réalisation des objectifs de réduction du Protocole de Kyoto et de la loi sur le CO₂*. Bern: UVEK.
- UVEK (Eidgenössisches Departement fuer Umwelt, Verkehr, Energie und Kommunikation). (2011). *Stratégie du DETEC (2012-2015)*. Bern: UVEK.
- Vatter, A. (1999). Föderalismus. In U. Klöti, P. Knoepfel, H. Kriesi, W. Linder, & Y. Papadopoulos (Eds.), *Handbuch der Schweizer Politik—Manuel de la politique suisse* (pp. 77–108). Zürich: NZZ Verlag.
- Vatter, A. (2004). Challenges to Intergovernmental Relations in Switzerland and Japan. *Swiss Political Science Review*, 10(3), 77–102.
- Vatter, A. (2008). Vom Extremtyp zum Normalfall? Die schweizerische Konsensdemokratie im Wandel: Eine Re-Analyse von Lijpharts Studie für die Schweiz von 1997 bis 2007. *Swiss Political Science Review*, 14(1), 1–47.
- Vatter, A., & Wälti, S. (2003). Schweizer Föderalismus in vergleichender Perspektive—Der Umgang mit Reformhindernissen. *Swiss Political Science Review*, 9(1), 1–25.
- Wälti, S. (1996). Institutional reform of federalism: Changing the players rather than the rules of the game. *Swiss Political Science Review*, 2(2), 113–141.
- Wälti, S. (2004). How multilevel structures affect environmental policy in industrialized countries. *European Journal of Political Research*, 43(4), 597–632.