

Progressing towards post-2012 carbon markets



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The National Context of U.S. State Policies for a Global Commons Problem

Abstract

Why should anyone be interested in the national context of a state policy? In the case of California's Global Warming Solutions Act (AB 32), the answer flows directly from the very nature of the problem – global climate change, the ultimate global commons problem. Greenhouse gases (GHGs) uniformly mix in the atmosphere. Therefore, any jurisdiction taking action – whether a nation, a state, or a city – will incur the costs of its actions, but the benefits of its actions (reduced risk of climate-change damages) will be distributed globally. Hence, for virtually any jurisdiction, the benefits it reaps from its climate-policy actions will be less than the cost it incurs. This is despite the fact that the global benefits of action may well be greater – possibly much greater – than global costs.

This presents a classic free-rider problem, in which it is in the interest of each jurisdiction to wait for others to take action and benefit from their actions (that is, free-ride). This is the fundamental reason why the highest levels of effective

government should be involved, that is, sovereign states (nations). And this is why international, if not global, cooperation is essential.

Despite this fundamental reality, there can still be a valuable role for subnational climate policies. Indeed, my purpose in this essay is to explore the potential for such state and regional policies – both in the presence of federal climate policy and in the absence of such policy. I begin by describing the national climate policy context and then turn to subnational policies, such as California's AB 32 and the Regional Greenhouse Gas Initiative (RGGI) in the Northeast. My focus is on how these subnational policies will interact with a federal climate policy. It turns out that some of the interactions will be problematic, others will be benign, and still others could be positive. I also examine the role that could be played by subnational policies in the absence of a meaningful federal policy, with the conclusion that – like it or not – we may find that Sacramento, California comes to take the place of Washington as the center of national climate policy.

The (Long-Term) National Context: Carbon Pricing

Virtually all economists and most other policy analysts favor a national carbon-pricing policy (whether carbon tax or cap-and-trade) as the core of any meaningful climate-policy action in the United States. Why is this approach so overwhelmingly favored by the analytical community?

First, no other feasible approach can provide truly meaningful emissions reductions (such as an 80 percent cut in national CO₂ emissions by mid-century). Second, it is the least costly approach in the short term, because abatement costs are exceptionally heterogeneous across sources. Only carbon pricing provides strong incentives that push all sources to control at the same marginal abatement cost, thereby achieving a given aggregate target at the lowest possible cost. Third, it is the least costly approach in the long term, because it provides incentives for carbon-friendly technological change, which brings down costs over time. Fourth, although carbon pricing is not sufficient on its own (because of other market failures that reduce the impact of price signals – more about this below), it is a necessary component of a sensible climate policy, because of factors one through three, above.

But carbon pricing is a hot-button political issue. This is primarily because it makes the costs of the policy transparent, unlike conventional policy instruments, such as performance and technology standards, which tend to hide costs. Carbon pricing is easily associated with the dreaded T-word. Indeed, in Washington, cap-and-trade has been successfully demonized as “cap-and-tax.” As a result, the political reality now appears to be that a national, economy-wide carbon-pricing policy is unlikely to be enacted before 2013. Does this mean that there will be no federal climate policy in the meantime? No, not at all.

The (Short-Term) National Context: Federal Regulations on the Way or Already in Place

Regulations of various kinds may soon be forthcoming – and in some cases, will definitely be forthcoming – as a result of the U.S. Supreme Court decision in *Massachusetts v. EPA* (April 2007) and the Obama Administration's subsequent endangerment finding (December 2009) that emissions of carbon dioxide and other greenhouse gases endanger public health and welfare. This triggered mobile source standards in mid-2010, the promulgation of which identified carbon dioxide as a pollutant under the Clean Air Act, thereby initiating a process of using the Clean Air Act for stationary sources as well.

Initial stationary-source standards took effect on January 2, 2011. The EPA plans to issue additional new source performance standards and possibly other stationary-source regulations later in 2011 and in 2012.

The merits that were originally suggested of such regulatory action are that it would be effective in some sectors and that the threat of such regulation will spur Congress to take action with a more sensible approach – namely, an economy-wide cap-and-trade system. However, regulatory action on carbon dioxide under the Clean Air Act will accomplish relatively little and do so at relatively high cost, compared with carbon pricing. Also, Congress has now rejected cap-and-trade and will not reconsider it in the near future. It is reasonable to ask, though, whether regulatory action was ever a credible threat; the implementation of inflexible, high-cost regulatory approaches may lend ammunition to the staunchest opponents of any climate policy.

Air pollution policies for non-greenhouse gas pollutants, the emissions of some of which are highly

correlated with CO₂ emissions, may also play an important role. Most importantly, without any new legislation, a set of rules now making their way through the regulatory process – affecting ambient ozone, SO₂ /NO₂, particulates, ash, hazardous air pollutants (mercury), and effluent water – could significantly reduce the portion of electricity generated by coal-fired power plants.

Finally, there is the possibility of new energy policies (not targeted exclusively at climate change) having significant impacts on CO₂ emissions. The possible components of such an approach that would be relevant in the context of climate change include: a national renewable electricity standard; federal financing for clean energy projects; energy efficiency measures (building, appliance, and industrial efficiency standards; home retrofit subsidies; smart grid standards, subsidies, and dynamic pricing policies); and a new federal electricity-transmission siting authority.

Even without action by the Congress or by the Administration, legal action on climate policy is likely to take place within the judicial realm. Public nuisance litigation will no doubt continue, with a diverse set of lawsuits being filed across the country in pursuit of injunctive relief and/or damages. Due to recent court decisions, the pace, the promise, and the problems of this approach remain uncertain.

Beyond the well-defined area of public nuisance litigation, other interventions which are intended to block permits for new fossil energy investments, including both power plants and transmission lines, will continue. Some of these interventions will be of the conventional NIMBY character, but others will no doubt be more strategic.

But with political stalemate in Washington on carbon pricing or national climate policy, attention is

inevitably turning to regional, state, and even local policies intended to address climate change.

Subnational Climate Policies

The Regional Greenhouse Gas Initiative (RGGI) in the Northeast (Figure 1) has created a cap-and-trade system among electricity generators. More striking, California's Global Warming Solutions

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Act (Assembly Bill 32, or AB 32) will likely lead to the creation of a very ambitious set of climate initiatives, including a statewide cap-and-trade system. The California system is likely to be linked with systems in other states and Canadian provinces under the Western Climate Initiative (Figure 2) (see later on linking). Currently, more than half of the 50 states are contemplating, developing, or implementing climate policies.

In the presence of a federal policy, will such state efforts achieve their objectives? Will the efforts be cost-effective? The answer is that the interactions of state policies with federal policy can be problematic, benign, or positive, depending upon their relative scope and stringency, and depending upon the specific policy instruments used (for elaboration see Goulder and Stavins, 2010).

Problematic Interactions

Let's start with the case of a federal policy which limits emission quantities (as with cap-and-trade) or uses nationwide averaging of performance (as with some proposals for a national renewable portfolio standard). In this case, emission reduc-

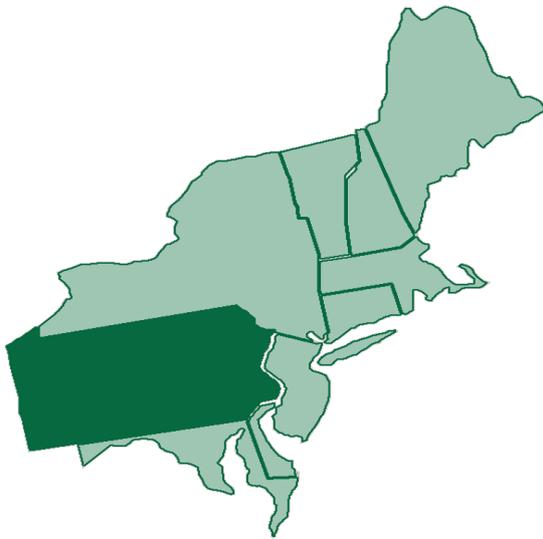


Figure 1. Map of the Regional Greenhouse Gas Initiative (RGGI)

RGGI is the first mandatory U.S. cap-and-trade program for carbon dioxide. It was established in December 2005 by the governors of seven North-eastern and Mid-Atlantic states; three additional states joined in 2007, and Pennsylvania remains an observer.

Source: The Pew Center on Global Climate Change 2011

tions accomplished by a “green state” with a more stringent policy than the federal policy – for example, AB 32 combined with Waxman-Markey/H.R. 2454 – will reduce pressure on other states, thereby freeing, indeed encouraging (through lower allowance prices) emission increases in the other states. The result would be 100 percent leakage, no gain in environmental protection from the green state’s added activity, and a national loss of cost-effectiveness.

Potential examples of this – depending upon the details of the regulations – include: first, AB 32 cap-and-trade combined with some U.S. Clean Air Act performance standards (neither H.R. 2454 nor anything like it are any longer on the table); second, state limits on GHGs/mile combined with federal Corporate Average Fuel Economy (CAFE) standards; and third, state renewable fuels standards (RFS) combined with a federal renewable fuels standard or state renewable portfolio standards (RPS) combined with a federal RPS. A partial solution would be for these federal programs to allow states to opt out of the federal policy if they had an equally or more stringent state policy. Such a partial solution would not, however, be cost-effective.

Benign Interactions

One example of benign interactions of state and federal climate policy is the case of the RGGI in the Northeast. In this case, the state policies are less stringent than an assumed federal policy (such as H.R. 2454). The result is that the state policies become nonbinding and hence largely irrelevant.

A second example – that warms the hearts of economists, but appears to be politically irrelevant for the time being – is the case of a federal policy that sets price, not quantity, i.e., a carbon tax or a binding safety valve or a price collar in a cap-and-trade system. In this case, more stringent actions in green states do not lead to offsetting emissions in other states induced by a changing carbon price. It should be noted, however, that there will be different marginal abatement costs across states, and so aggregate reductions would not be achieved cost-effectively.

Positive Interactions

Three scenarios suggest the possibility of positive interactions of state and federal climate policies. First, states can – in principle – address market failures not addressed by a federal carbon-pricing policy (should there ever be one). A prime exam-

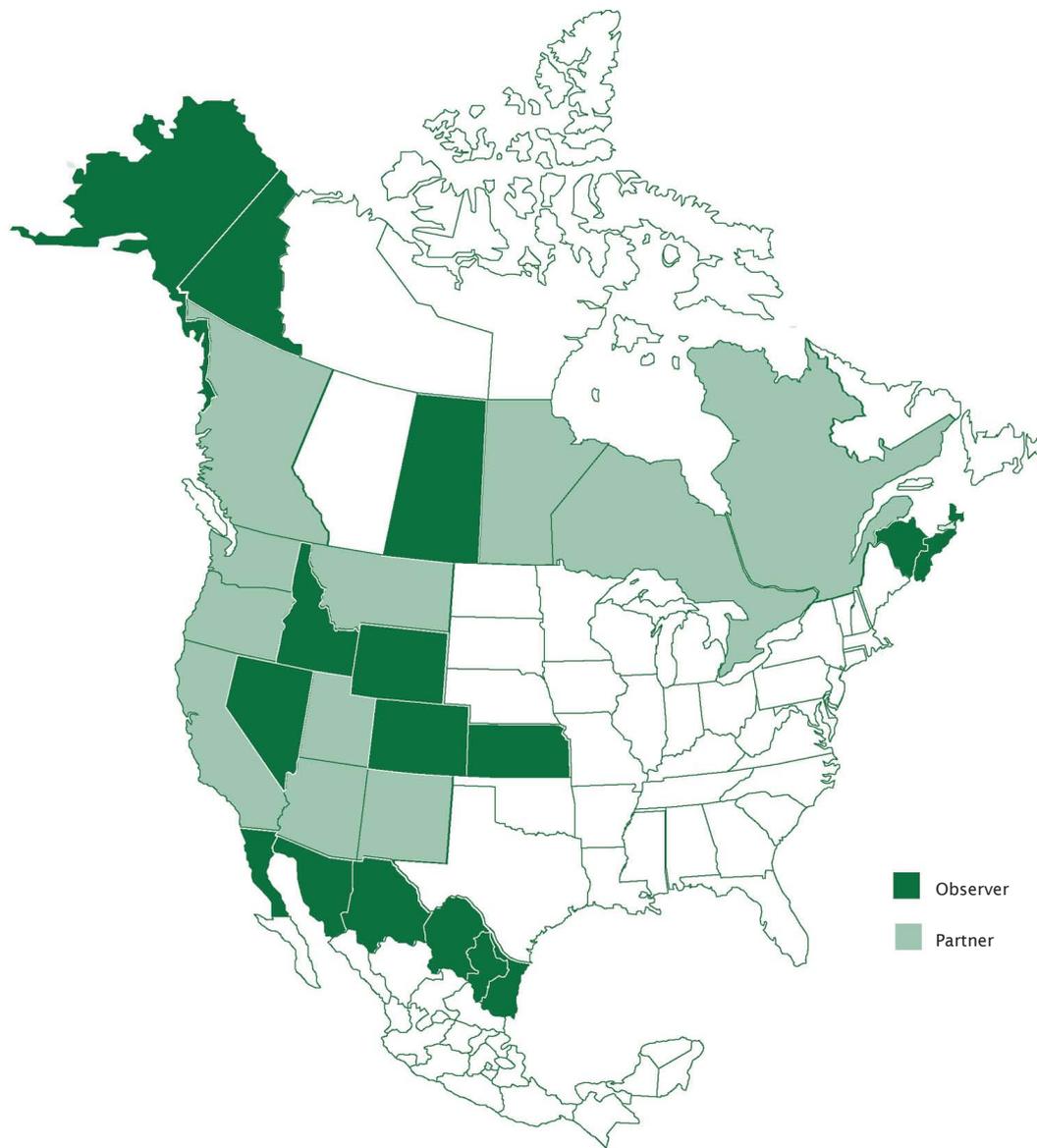


Figure 2. Map of Western Climate Initiative

The WCI is a collaboration of independent jurisdictions who work together to identify, evaluate, and implement policies to tackle climate change at a regional level. Other U.S. states, Canadian provinces, Mexican states, and tribes are encouraged to participate in the WCI as either partners or observers.

Source: Western Climate Initiative 2011

ple is the principal agent problem of insufficient energy-efficiency investments in renter-occupied properties, even in the face of high energy prices.

This is a problem that is best addressed at the state or even local level, such as through building codes and zoning.

Second, state and regional authorities frequently argue that states can serve as valuable “laboratories” for policy design and thereby provide useful information for the development of federal policy. However, it is reasonable to ask whether state authorities will allow their “laboratory” to be closed after the experiment has been completed, the information delivered, and a federal policy put in place. Pronouncements from some state leaders should cause concern in this regard.

Third, states can create pressure for more stringent federal policies. A timely example is provided by California’s Pavley I motor vehicle fuel-efficiency standards and the subsequent change in federal CAFE requirements. There is historical validation of this effect, with California repeatedly having increased the stringency of its local air pollution

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standards, followed by parallel federal action under the Clean Air Act. This linkage is desirable if the previous federal policy is insufficiently stringent, but whether that is the case is an empirical question.

Thus, in the presence of federal climate policy, interactions with subnational policies can be problematic, benign, or positive, depending upon the relative scope and stringency of the subnational and national policies, as well as the particular policy instruments employed at both levels. (For a more rigorous derivation of the findings above, see Goulder and Stavins, 2010).

International perspectives

– The Linking of Trading Systems

At the international level, tradable permit systems are emerging as a preferred instrument for reducing greenhouse gas (GHG) emissions. Two of the most significant institutions for reducing GHG emissions implemented to date – the European Union Emission Trading Scheme (EU ETS) and the Clean Development Mechanism (CDM) – are tradable permit systems. Australia, Canada, Japan, and New Zealand, among other countries, are considering or have put in place tradable permit systems for reducing GHG emissions. As these systems grow in prominence and number, attention has increasingly focused on whether and how to link them.

Linking occurs when a tradable permit system’s regulatory authority allows regulated entities to use emission allowances or emission reduction credits from another system in order to meet compliance obligations. Linking thereby allows these entities to take advantage of the cost savings from international trade in allowances or credits.

As mentioned the Regional Greenhouse Gas Initiative provides for several types of one-way links. Covered sources may use emission reduction credits from qualified domestic offset projects, subject to quantitative limits that depend on the prevailing RGGI allowance price. When the RGGI allowance price exceeds a specific threshold, which increases over time, sources have the additional option to use CERs and allowances from other countries’ cap-and-trade systems, such as the EU ETS, in meeting their compliance obligations.

Linking tradable permit systems leads to diverse effects that need to be considered in assessing both the merits of particular linkages, be it among state-based systems or internationally, and the merits of linkage as a major design element of a post2012 international policy architecture.

The degree of control that a (State) government can retain over its system depends in part on whether linkage is one-way or two-way. For example, two-way linkages can increase *or* decrease domestic allowance prices. Two-way linkages lead to complete propagation of cost-containment measures across the linked systems. In contrast, one-way linkages can only decrease the price of allowances in the system that establishes the link. One-way linkages therefore will only lead to propagation of cost-containment measures in one direction – from the system with which a link is established to the system that establishes the link.

The effects of a linkage also depend on whether it connects two cap-and-trade systems or a cap-and-trade system and an emission-reduction-credit system. For example, linkage that involves an emission-reduction-credit system raises the issue of additionality. On the other hand, in a link between two cap-and-trade systems, the increase in allowance prices in one may have more far-reaching economic consequences – such as increasing domestic energy prices – than would the increase in credit prices resulting from a link between a cap-and-trade system and a credit system. In a credit system, entities are not required to meet any emissions targets and thus can only benefit from the opportunity to sell credits for higher prices.

Linkage as a Bottom-Up International Policy Architecture

Bilateral linkages are likely to continue to evolve among national and regional cap-and-trade systems and the CDM (or its successor). Could such a set of linkages, established without central coordination, function as an effective, standalone, bottom-up international policy architecture? – And if so would this in effect entail a significant *de facto* U.S. participation?

Although such an architecture would need to include other design elements, including emission

reduction commitments and participation incentives, its distinguishing feature would be that it would grow organically from direct and indirect

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linkages. The degree to which a system of bottom-up linkages could achieve meaningful environmental performance depends on whether participants set sufficient environmental targets, a sufficient number of key countries participate, and participants comply.

With regard to whether participants will set meaningful environmental targets, commitments to reduce emissions in an architecture of bottom-up linkages would result from unilateral decisions by individual nations, or from negotiations among small groups of nations. In developed countries, internal political support would probably be the driving force behind adoption of more stringent emission caps, whereas adoption of emissions caps by developing nations may depend upon incentives provided by committed developed countries. To address the possibility that linking may create incentives for some countries to adopt less stringent future caps, countries could negotiate cap trajectories as a condition for linking. On the other hand, a system of linkages may actually allow some countries to adopt more aggressive targets than they otherwise would.

Links among cap-and-trade systems create gains from trade for the participating countries. Therefore, such an architecture has the potential to be cost-effective if the bottom-up system includes a sufficient set of direct two-way links, or if the sys-

tem relies primarily on indirect links through a common credit system (a sort of clearing house) that has an adequate supply of low-cost credits to bring about allowance price convergence.

A bottom-up system of linkage is already evolving for example in the U.S., and could function well in the nearterm in the absence of a top-down post-2012 international policy architecture. However, for a bottomup system to achieve meaningful long-term environmental performance and a high degree of participation, it would require the major

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emitters – the United States, the European Union, Russia, Japan, China, India, and other key countries – to reach an implicit agreement regarding emissions targets and incentives for participation. Whether this would be possible without centralized negotiations is an open question.

Subnational Climate Policies in the Absence of Federal Action

Cap-and-trade systems are emerging as a preferred domestic instrument for reducing GHG emissions in many parts of the world, the CDM having developed a substantial constituency despite some concerns about its performance. Because of the considerable political and economic pressure to link these systems, linkage may be expected to play a de facto, if not de jure, role in any future international climate policy architecture.

In the U.S., comprehensive federal carbon-pricing policy appears to be delayed until 2013, at the earliest. And it is possible that pending federal regulatory action under the Clean Air Act will be

curtailed or significantly delayed either by the new Congress or by litigation. Therefore, it is important to consider the role of state and regional climate policies in the absence of federal action. State policies and the linking of state policies is an obvious first step in the absence of any federal policy.

In brief, in the absence of meaningful federal action, subnational climate policies could well become the core of national action with potential links also to the international level. Problems will no doubt arise, including legal obstacles such as possible federal preemption or litigation associated with the so-called “Dormant” Commerce Clause.

Also, even a large portfolio of state and regional policies will not be comprehensive of the entire nation, that is, not truly national in scope (for a quick approximation of likely coverage, check out a recent map of blue states and red states).

And even if the state and regional policies were nationally comprehensive, there would likely be different policies of different stringency in different parts of the country. As a result, carbon shadow-prices would not be equivalent, and overall policy objectives would be achieved at excessive social cost.

Is there a solution (if only a partial one)? Yes. If the primary policy instrument employed in the state and regional policies is cap-and-trade, then the respective carbon markets can be linked. Such linkage occurs through bilateral recognition of allowances, which results in reduced costs, reduced price volatility, reduced leakage, and reduced market power. Good news all around.

Such bottom-up linkage of state and regional cap-and-trade systems could be an important part, or

perhaps even the core, of future of U.S. climate policy, at least until there is meaningful action at the federal level. In the meantime, it is at least conceivable – and perhaps likely – that linkage of state-level cap-and-trade systems will become the (interim) de facto national climate policy architecture.

In this way, Sacramento would take the place of Washington as the center of national climate policy deliberations and action. No doubt, this possibility will please some and frighten others.

References:

Lawrence Goulder and Robert Stavins (2011): Challenges from State-Federal Interactions in U.S. Climate Change Policy, in *American Economic Review Papers and Proceedings*, volume 101, number 3, pages 253-257

Matthew Ranson, Judson Jaffe, and Robert Stavins (2010): Linking Tradable Permit Systems: A Key Element of Emerging International Climate Policy Architecture, in *Ecology Law Quarterly*, 36, pages 789-808

The Pew Center on Global Climate Change (2011): Regional Greenhouse Gas Initiative (RGGI), http://www.pewclimate.org/what_s_being_done/in_the_states/rggi

Western Climate Initiative (2011): www.westernclimateinitiative.org/wci-partners-and-observers-map

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