

# US and China Cooperation on Climate Policy Design

By Frank A. Wolak

**I**ncreasingly disappointing outcomes from Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC) meetings around the world over the past 20 years provides ample evidence that a “top-down” approach that requires countries to agree to greenhouse gas (GHG) emissions reductions targets and then implement coordinated policies to achieve them is unlikely to succeed. Initially, a number of industrialized countries agreed to tangible GHG emissions reductions, specifically the European Union (EU) countries through the EU Emission Trading system (EU-ETS). However, the United States, until recently the world’s larger emitter of GHGs, has yet to set legally binding targets, and neither has China, currently the world’s largest emitter of GHGs.

According to the European Commission, the US and China accounted for 36 percent of global GHG emissions in 2010. Because China’s GHG emissions have grown significantly over the past three years, this percentage is likely to be much higher in 2014. With these two countries accounting for such a large fraction of global GHG emissions, any climate policy that does not include them is doomed to fail.

## A “bottom up” approach

In spite of the dismal performance of the COP-UNFCCC top-down approach, recently there has been tangible climate policy progress in the US, China and other industrialized countries. A new paradigm is emerging where a country or region first designs and implements its own climate policy with the ultimate goal of linking it with those in other jurisdictions.

This “bottom-up” approach appears to be gaining momentum because it allows each jurisdiction to address its unique economic and political challenges before attempting to coordinate its climate policies with other jurisdictions. The major domestic stakeholders impacted by a climate policy can contribute to its initial design in familiar regional or national political processes.

A number of countries and regions have or are in the process of implementing their own climate policies. The province of British Columbia in Canada has a 30 Canadian Dollar per ton tax on carbon dioxide emissions. California has implemented a cap-and-trade market for GHG emissions that has priced carbon dioxide emissions at between 10 to 14 US dollars per ton over the past two years.

Effective the first of January 2014, the California program linked with the cap and trade program in the Canadian province of Quebec. Linkage means that allowances issued by Quebec can be used to meet GHG emissions obligations in California and allowances issued in California can be used to obligations in Quebec. The agreement to link the two programs involved significant cooperation and information sharing between the two governments over the past five years.

The Program on Energy and Sustainable Development that I direct at Stanford University recently held an international conference on regional carbon policies that brought together scholars and policymakers from around the world to discuss the full implications of this approach. Besides sessions on the US, Canada, and Europe, it also featured a session on China’s nascent efforts.

A major conclusion was that China will implement



The California cap-and-trade market for GHG emissions and its linkage with the market in Quebec, offers many lessons for the design of China's carbon policies.

an emissions trading system or carbon tax. Currently there are a number of municipal-level or industrial region-level pilot carbon emissions trading schemes. However, it was difficult to tell from the conference presentations if what was called carbon emissions trading in China was the same as carbon emissions trading in the US and other industrialized countries. This led me to conclude that there could be significant benefits to both US and China from information sharing on their regional policies.

### **The California cap-and-trade market**

Since the summer of 2012, I have been a member of the Emissions Market Assessment Committee (EMAC) of the California Air Resources Board (ARB), the state agency charged with designing the rules for the state's cap-and-trade market. This work has convinced me that designing a regional cap and trade market that achieves its intended goal present a number of unique challenges.

The assumption that no market participant can impact market prices through its unilateral actions is unlikely to hold in a regional market. Therefore, safeguards must exist to prevent large market participants from taking privately profitable actions that harm the efficiency of the market. The California cap and trade market has a number of such safeguards in place.

There are many useful lessons for China and other international jurisdictions that emerge from the process of designing the California cap and trade market. For example, California addressed a key shortcoming of the EU-ETS by setting a floor and a ceiling on the price of allowances. The floor effectively eliminates

extremely low prices (such as those currently in the EU-ETS) which dull the incentive for investments in emissions mitigation technologies. The ceiling prevents excessive allowance prices that may impose exorbitant costs on emitters or lead to suspension of the program.

The GHG emissions cap in California at the end of the 8-year compliance period is designed to reduce 2020 GHG emissions to 1990 levels. Of the 2,508.6 million metric tonnes (MMT) of allowances in the program over the 8-year period, roughly 5 percent are assigned to an allowance price containment reserve (APCR) to be made available at pre-set price levels. These prices effectively cap allowance prices because market participants always have the option to purchase them at the relevant ACPR price, as long as there are available allowances in the ACPR.

Unlimited banking and limited borrowing of GHG allowances is permitted throughout the program. For example, 2013 and 2014 vintage allowances are the only allowance vintages that can be used to meet compliance obligations during these two years of the program. However, these allowances can also be used to meet compliance obligations during all years of the program.

A significant fraction of each allowance vintage is allocated to compliance entities based on two criteria:

**(1)** the extent to which it faces competition for its output from firms located outside of California, and

**(2)** the amount of GHG emissions produced by that compliance entity in the previous year. The fraction of total allowances allocated will decline each year of the program.

The ARB also allocates allowances to electricity retailers with requirement that they use the revenues from the sale of these allowances to electricity generation unit owners to offset wholesale electricity price increases caused by setting a price for GHG emissions. These features of the California program limit GHG-emissions-reducing activities in California, because the output prices for many carbon-intensive goods sold in California will not fully reflect the price of carbon.

California has also implemented several market rules to limit the ability of market participants to take actions to raise or lower the price of allowances through withholding strategies. All market participants are subject to limits on the amount of allowances they can hold for purposes of trading and the amount they can hold for the purposes of meeting their compliance obligations.

Allowances held in a compliance entity's Holding Account can be traded. Once an allowance is transferred from a compliance entity's Holding Account into its Compliance Account, the allowance can only be used to meet that entity's compliance obligation. Although these features of the California program are controversial with some market participants, they significantly limit the incentive of large compliance entities to take privately-profitable actions that harm the integrity of the market.

The ARB has sold almost 150 million allowances for almost 1.8 billion dollars in six quarterly auctions between November 2012 and February 2014. There is also an active secondary market for allowances and several financial markets for trading forward contracts for the future delivery of these allowances.

### Market design implications for China

China and other countries developing regional carbon policies must make similar market design choices to the ones described above for California. If these regional policies build on California's experience, linking these regional markets will be more

straightforward than if the policies were designed without regard to the California experience. A China and California market linkage, similar to that between Quebec and California, will be a major step towards implementing national policies in the US and China.

Significant political barriers to implementing national climate policies exist in both the US and China. Successful linkage of regional climate policies in the two countries can help overcome these impediments. Each country can be seen as willing to cooperate with the other to address the global climate challenge, which can help each national government overcome the resistance to formulating its own national climate policy.

Solving the climate challenge involves many years of sustained actions coordinated across the major emitting countries. Like any long journey, it begins with a first step. Coordinating regional policies is such a step.



**Frank A. Wolak**

Director, Program on Energy and Sustainable Development;  
Professor, Department of Economics, Stanford University