CLI RECOMMENDATION NO. 6

Institute Cap-and-Trade Strategies for Allocations to Energy Efficiency*

I. Overview

Many resource economists and air pollution experts promote the use of cap-and-trade systems to control GHG emissions generally, including emissions from the power sector. Support for this approach is based on the experience of the U.S. Acid Rain Program, viewed as a success in reducing CO2 emissions at lower costs than those expected under historic technology-based regulatory models.

Recent experience in Europe and design studies in the U.S. now reveal that the cap-and-trade architecture used for the U.S. Acid Rain Program, and copied in other systems such as the European carbon trading system, is not optimal for carbon management.

There are two core structural problems with these new GHG cap-and-trade design efforts:[1]

- By taking a "generator-down" approach to GHG management, instead of focusing on the portfolio management activities of distribution utilities and other load-serving entities (LSEs), they cost consumers more than other models that take an "efficiency and portfolio-up" approach to GHG reduction; and
- By awarding carbon allowances to emitters on the basis of their historic pollution, they provide a windfall to generators far in excess of their cost of program compliance[2] and charge consumers more than needed to achieve a given level of reduction (up to 3 or 4 times more).

Program designers are now learning from these early efforts. With respect to the cap-and-trade program itself, the most important policy innovation is the Carbon Allocation for Efficiency, in which carbon allowances are auctioned by the government, and the resulting revenues dedicated to investments in low-cost, low-carbon resources that will reduce emissions, power costs, and the price of carbon allowances themselves. Such a system will lower the economic cost per ton of carbon reduction—which is essential to accomplishing deep and rapid cuts in emissions for the benefit of future generations.

---

* This recommendation was authored by Richard H. Cowart, 2008 Distinguished Visiting Energy Scholar at Vermont Law School, and Director of The Regulatory Assistance Project, and Michael H. Dworkin, Professor of Law and Director of the Institute for Energy and the Environment at Vermont Law School.

[1] In addition to these architectural or design problems, future generations are also affected by the fact that these early programs are insufficiently rigorous. Both Phase I of the European Trading System, and the leading U.S. system (the Regional Greenhouse Gas Initiative, or RGGI) are "*overallocated*"—that is, they mistakenly set the caps too high, and awarded too many allowances, undercutting the price of allowances and, more importantly, the actual effects of the control programs.

[2] Recent studies by Resources for the Future (for RGGI); the U.S. GAO (for the U.S.) and the House of Commons Environmental Audit Committee (for the U.K. trading system) have all documented this problem.

II. Cap-and-Trade Basics—Why Carbon is Different

The U.S. Acid Rain Program is widely regarded as successfully demonstrating the advantages of cap-and-trade programs for environmental improvement.[3] Most observers conclude that the incentives created by the program and emitters' ability to trade allowances have led to less expensive attainment of the program's goals. The success of this model has led many decision-makers to conclude that carbon cap-and-trade programs should be built on the same basic structure. Unfortunately, it is not so easy, especially considering the crucial role of energy efficiency to program success. At the outset it is necessary to dispel three very misleading assumptions that often seem to waylay cap-and-trade analysts.

The first wrong assumption is that a carbon tax or its equivalent, such as an auction of pollution credits,[4] will inspire a conservation response among consumers that will deliver the socially-optimal level of investment in end-use efficiency. Cap-and-trade architects expect that lowering carbon emissions from power plants will raise the cost of electricity. Influenced by standard economic theory on internalized external costs, they often view increased power prices as desirable, and any resulting demand reductions as merely a consequence of the program. A better approach is to view avoidable increased costs as undesirable, and efficiency as an integral component of the cap-and-trade program.

Why? More than two decades of experience with utility DSM programs has demonstrated in practice that price increases alone will not deliver anything close to the societally cost-effective level of investments in efficiency. On the one hand, the price-elasticity of demand for electricity is quite low (about -.32 in the U.S. in recent decades, and the effect is lowered as incomes rise). In addition, there are numerous, well-documented market barriers to cost-effective efficiency investments, and they will continue to block needed improvements even after whatever rate increases could possibly be expected to flow from a carbon cap-and-trade program.[5]

On the other hand, there is widespread experience with utility-sector DSM programs, and with codes and standards, revealing a huge untapped reservoir of energy efficiency potential at the cost of three cents per kwh—much lower than the marginal cost of supply. For these reasons the power system will realize about seven times more savings from each dollar spent in a well-managed efficiency program, than it will through a generalized, across the board price increase.

III. Discussion: How Can We Recapture Generator Windfalls and Promote Low-Cost Efficiency?

Where will power sector carbon reductions come from? GHG regulators in the U.S. now recognize that most of the actual reductions are going to come as a result of deliberate portfolio management decisions, especially the use of Renewable Portfolio Standards and utility-sector energy efficiency programs. Extensive modeling has shown that most of the reductions that will occur in the U.S. state and regional GHG reduction programs[6] are going to come from these so-called "parallel" policies, and not from the imposition of a carbon price alone. There are two basic options to address these realities.

---

[3] *See, e.g.*, http://www.whitehouse.gov/news/releases/2002/02/clearskies.html (last visited Sept. 1, 2008).

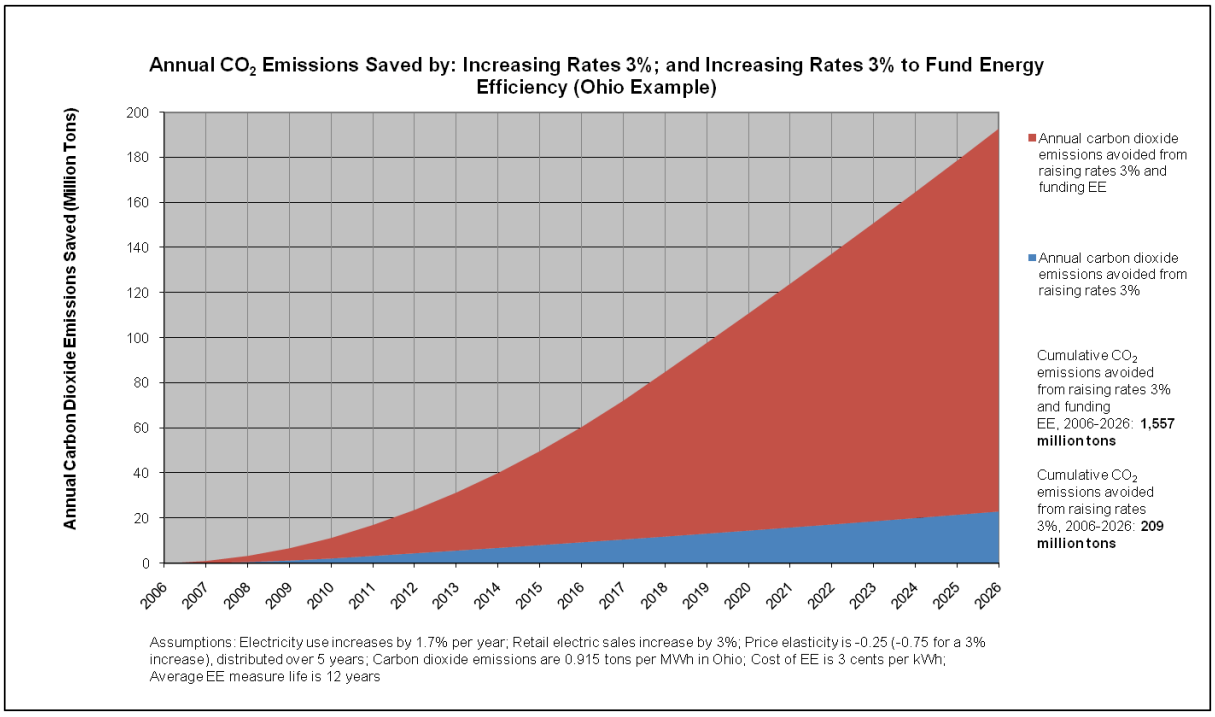
[4] Or even the free allocation of credits under a cap-and-trade system. As will be discussed below, most economists and market participants agree that once credits are made tradable through a cap and trade system, they will have the same upward pressure on power prices regardless of whether they were initially sold to emitters or distributed for free.

[5] There is an extensive literature detailing these market barriers, including access to information, high first-cost problems, consumers' high discount rates, unpriced externalities, the landlord-tenant problem, and others.

[6] There are now three large regional cap-and-trade initiatives underway in the U.S.: the Regional Greenhouse Gas Initiative (10 Northeastern and Mid-Atlantic states); the Western Climate Initiative; and the Midwest Governors Greenhouse Gas Accord.

A. Load-Side Cap-and-Trade

A strength of cap-and-trade systems for conventional pollutants is that they assign clean-up responsibility and credits to those actors (owners of smokestacks) who are in the best position to take mitigating actions—e.g., switches to lower-sulfur fuels, combustion technology changes, and scrubbers. In the case of carbon, since there is no reasonably-priced carbon scrubber, and no source of "low-carbon coal," mitigation relies chiefly upon actions that are within the authority of load-serving entities (termed "LSEs", usually local distribution electric companies) and their end-use customers. It is their portfolio management decisions—such as buying from different generators, choosing renewable supplies, and especially, investing in end-use energy efficiency— that will yield carbon reductions in the power sector.



Thus, there is a tighter link between responsibility and opportunity where regulation puts carbon content requirements on the wholesale *consumers* of electricity,[7] rather than on *fossil generators*. This is called load-side cap-and-trade. Load-side cap-and-trade has been recommended by decision-makers in California and Oregon, but is not likely to be adopted, and will not be discussed in detail here.

B. The Consumer Allocation in RGGI and the Northeast States

The second leading approach to better cap-and-trade design is to allocate allowances for the long-term benefit of power consumers, and especially the Carbon Allocation for Efficiency. The Regional Greenhouse Gas Initiative (RGGI)

[7] Importantly, "load-side" in this context does not mean each and every retail electric customer, but rather the much smaller number of distribution electric companies or other retail providers who are responsible for providing electric energy and capacity to end-users (in utility terminology, these are "load-serving entities").

is the leading effort in the United States to cap GHG emissions from the power sector. The RGGI region now extends to ten states, stretching from Maine to Delaware.[8] The RGGI Memorandum of Understanding sets out the essential elements of a proposed Model Rule, which will still need to be adopted by each state that will be part of the cap-and-trade region.[9] Rule-makings are underway now in most states, with implementation dates in 2009.

The most important new element in the RGGI process has been the creation of a formal Consumer Allocation of carbon credits, rather than the automatic allocation of all credits to generators on the basis of their historic emissions. This is a significant departure from previous cap-and-trade regimes, and depending on how states implement this objective, could substantially advance investments in energy efficiency in the RGGI region. The RGGI consumer allocation provisions could support a 50% to 150% increase in investments in energy efficiency in the RGGI region over the next decade.[10]

1. Two purposes for the Consumer Allocation: Recapturing Windfalls and Promoting Efficiency

Both experience and economic studies show that there can be a very large generator windfall from the wrong type of carbon allocation. Several studies on the free allocation of carbon allowances to generators have found the likelihood of substantial windfall gains to generators. One study prepared for RGGI estimated that total generator windfalls from 100% historic free allocation could total $1 billion or more annually.[11] More generally, the Congressional Budget Office found that "producers would have to receive only a modest portion of the allowances to offset their costs from a cap on carbon emissions. . . ."[12] European governments that initially allocated allowances to generators on a free, historic basis are now having second thoughts, based on the early experiences of the European Union carbon trading system.[13]

The simplest way to solve these problems and reduce the unnecessary rate impacts of a generator-based cap is to award a large fraction of allowances in each compliance period to consumers, represented by their distribution companies or other supervised trustees acting on their behalf. By then selling these allowances in the credits market to generators, consumers' agents can recover through the credits market some of the generator windfalls that flow from the structure of today's wholesale power market. This revenue-recapture mechanism is essentially a market-based means of doing through program design what regulators historically would have done through cost-of-service rate-making.

---

[8] Six states in New England, plus Delaware, Maryland, New Jersey, and New York are RGGI signatories, now creating state implementing regulations. Pennsylvania is officially an observer state, and unlikely to join RGGI soon.

[9] While styled as a "regional" effort, there is no regional governmental body with regulatory authority to implement RGGI. Individual states must enact their own regulations, simply agreeing to recognize carbon credit trading with credits from other states on a reciprocal basis.

[10] The amount of funding available for efficiency will depend on the fraction of carbon credits allocated for this purpose, and the value of carbon credits in the market. Energy efficiency spending in the RGGI region has been just over $500 million annually. If 90% of the roughly 180 million allowances regionwide were used to support efficiency programs, and if they sold for $5 per ton, the resulting revenue would increase total regional spending by $800 million, or more than 150% . Between 2009 and 2020, RGGI carbon sales could provide more than $4 billion for improved energy efficiency in the RGGI region.

[11] Dallas Burtraw *et al.*, *Allocation of CO2 Emission Allowances in the Regional Greenhouse Gas Cap-and-Trade Program*, *in* Resources For The Future (Dec. 24, 2004).

[12] Congressional Budget Office, Issues in the Design of a Cap-and-Trade Program for Carbon Emissions (Nov. 25, 2003), *available at* http://www.cbo.gov/doc.cfm?index=4861&type=0. Others have found that generators would require as little as 13% of allowances to recover their compliance costs in a cap-and-trade program (Goulder/Standford).

[13] *See, e.g.*, United Kingdom House of Commons, Environmental Audit Committee, "The International Challenge of Climate Change: U.K. Leadership in the G8 and EU" (Mar. 2005), at 17: "We also noted that the use of grandfathering as a means to allocate emissions permits is likely to result in substantial windfall profits for power generators throughout the EU."

2. Using the Consumer Allocation To Support Efficiency and Lower the Cost of Carbon Management

A large consumer allocation can lower the cost of the carbon reduction program to consumers by recapturing and recycling generator price increases for the benefit of consumers. But in what form should those benefits be returned to consumers? Some consumer advocates have proposed that revenues from the sale of carbon credits should be returned to consumers in the form of rate rebates. Others are advocating a so-called "Cap and Dividend" approach to carbon allocation, in which allowances are auctioned to emitters, with the revenues returned directly to citizens in the form of direct payments, styled after the Alaska Permanent Fund, or through tax rebates. However, these carbon rebate approaches will not produce the best long-term result for consumers or for society as a whole. The best outcome for consumers as a whole, and the best way to lower the overall cost of carbon reduction is to invest carbon credit revenues in low-carbon resources serving consumers, especially low-cost energy efficiency measures.

There is good evidence for this conclusion. For example, modeling runs conducted by ACEEE for RGGI revealed that increasing the region's spending on energy efficiency was the key to lowering the overall cost of carbon reductions to the economy. That study found that doubling investments in energy efficiency throughout the RGGI region would lower projected load growth to 2020 by two-thirds, from about 20% above to about 6% above 2006 sales levels.[14] Increased efficiency also reduces carbon emissions, holding them roughly constant for an extended period and thus greatly reducing the cost of attaining the reductions needed to meet RGGI's overall carbon objectives. The ACEEE study also concluded that doubling efficiency could avoid around 8000 MW of new capacity additions, and would reduce average power bills by over $100 annually by 2020.[15]

3. Using Carbon Credits to Deliver Efficiency: Early State Actions

In December 2005, the Governors of seven RGGI states signed the RGGI MOU, which includes a provision under which each RGGI state will propose to assign at least 25% of the state's carbon allowances to a consumer allocation.[16] Shortly thereafter, in 2006, the Vermont General Assembly adopted legislation formalizing the state's participation in RGGI, requiring an auction of 100% of the state's power sector GHG allowance, and dedicating 100% of the resulting auction revenues to investments in low-carbon resources, especially end-use energy efficiency. That statute states, in part:

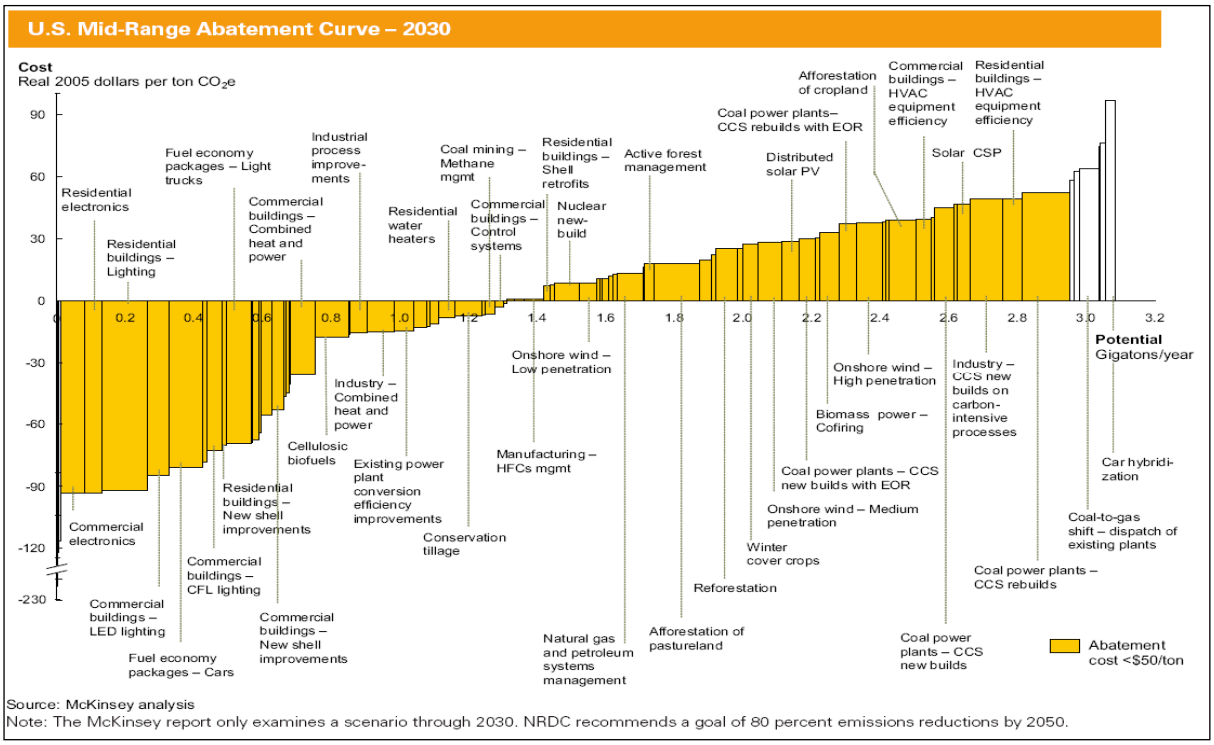
> In order to "provide the maximum long-term benefit to Vermont electric consumers, *particularly benefits that will result from accelerated and sustained investments in energy efficiency* and other low-cost, low-carbon power system investments . . . the public service board . . . *shall allocate 100 percent of* [Vermont's] tradable power sector carbon credits and the proceeds from the sale of those credits through allocation to one or more *trustees acting on behalf of consumers*."[17]

[14] William Prindle, *et al.*, "Energy Efficiency's Role in a Carbon Cap-and-Trade System: Modeling Results from the Regional Greenhouse Gas Initiative," ACEEE (May 2006), at 2.

[15] *Id.* at 2–4.

[16] Regional Greenhouse Gas Initiative, Memorandum of Understanding, Section G (1) (Dec. 2005).

[17] H.860 (2006) codified at 30 VSA S254 (c) (2).



Source: McKinsey analysis
Note: The McKinsey report only examines a scenario through 2030. NRDC recommends a goal of 80 percent emissions reductions by 2050.

Vermont thus became the first jurisdiction to create a substantial consumer allocation of power sector carbon credits, and the first to use those credits to finance expanded investments in energy efficiency.[18]

Other states in the RGGI region are also allocating a significant percentage of allowance proceeds to energy efficiency. For example, in Connecticut at least 66% of allowance proceeds are expected to be invested in energy efficiency and conservation programs. In Maine, most allowance proceeds will be transferred to a consumer benefit account, with a portion targeted at combined heat and power at manufacturing facilities. Massachusetts DOER regulations express an intention to use the proceeds for energy efficiency, and additional legislation is pending. Currently, most states are in the process of codifying how allowances are used through proposed legislation and rulemaking proceedings. Between 90% and 100% of allowances currently are expected to be auctioned in each state. Some of the states are directing a percentage of allowances for certain set-asides or direct allocations, but these are transitional and are expected to phase out over time. In every state that is in the more advanced stages of its decision-making, energy efficiency is the primary activity for RGGI allowance proceeds.

4.Creating a Performance-Based Efficiency Allocation in National Climate Legislation

A number of observations can be drawn from the experience of power sector efficiency programs, from the history of air quality programs, and from the efforts underway in the RGGI and Western states to design state and regional cap-and-trade programs. Building on those experiences, when Congress enacts cap-and-trade legislation, it

[18] In 2008, the Vermont legislature revisited this issue, confirmed the consumer allocation for efficiency, and directed that the credit value be used to support efficiency in buildings across all fuels on a "whole buildings" basis (S.209, 2008).

should create a national, performance-based Carbon Allocation for Efficiency[19] with a significant fraction of carbon allowances. The purpose of this allocation is to advance the national interest by encouraging states and utilities to accelerate the delivery of energy efficiency services to families and businesses in their states.

Accelerated investments in efficiency, as shown above, will:

- Reduce power sector GHG emissions at lower cost than other options;
- Lower bills for consumers and offset other energy cost increases due to world market forces and other aspects of climate change legislation;
- Lower price pressure on carbon allowances, providing a cost containment benefit to the entire climate program;
- Reduce demand growth on power grids, improving reliability and reducing the need for expensive and economically riskier generation and transmission investments; and
- Improve the nation's energy security by reducing demand for imported energy.

Under this proposal, a significant fraction of allowances created in a national cap-and-trade system would be allocated annually to states (and/or local electric and gas utilities) in order to promote and reward the multitude of state and local actions that are necessary to deliver greater energy efficiency in millions of customer locations and communities across the nation.

The Efficiency Allocation should be performance-based. At first, allowances could be allocated to every state on a common formula, based upon population and historic energy consumption. However, over an initial ramp-up period of four to five years, allowances should be distributed to states to reflect their rate of improvement in efficiency, according to standard measures established by the national program administrator. Each state's annual allocation would be based on demonstrated improvement against that state's own historic baseline, providing an evenhanded way to encourage greater efficiency in each jurisdiction. It does not favor today's leading states, nor does it grandfather a high level of emissions allocations to today's high-emitting states. Recent actions can be rewarded through selection of the baseline years.

While the focus of this recommendation is on the power sector, there could be separate allocations (or measurements) for improved efficiency in the utility sectors, in buildings, and in transportation as well. Improving energy efficiency is the least-cost method for attaining national emission reductions, but most of the work has to be done locally and through state policies. A large fraction of allowances (30% or more) could be distributed to states to encourage aggressive state action.

The national program would not need to dictate methods or means of achieving efficiency goals; states, local governments, utilities, and third parties should be free to use a variety of techniques, and to experiment. Thus, codes, standards, incentives, utility programs, rate-making, smart growth policies, competitive acquisition, etc. can all be supported without the need for national rules or standards for today's preferred techniques.

With respect to the use of allowance values, national legislation could either establish eligible categories of expenditures or categories of recipients, or leave distributional questions to the states. If distribution among the states is performance-based and based on the right criteria, then national objectives are being met regardless of how states distribute allowances or spend the revenue.

---

[19] A brief description can be found at Richard Cowart, RAP, and Steve Nadel, ACEEE *Carbon Allocation for Efficiency: A Performance-based Distribution of Carbon Allowances to Reduce CO2 Emissions and Lower the Cost of Cap-and-Trade* (Mar. 2008), *available at* http://www.raponline.org/pubs/rc-testimony_us_house_select_committee-may2008.pdf.