Comment on *Addressing Climate Change With a Comprehensive U.S. Cap-and-Trade System*

by Kathleen A. McGinty

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Prof. Robert Stavins has contributed greatly to the evolution of environmental policy. He's pioneered new instruments for achieving environmental progress and improved the effectiveness of traditional tools. This paper is no exception.[1] Here, Dr. Stavins offers compelling counsel on how best to structure a cap-and-trade policy to achieve reductions in greenhouse gas pollution.

Several points in Dr. Stavins' article bear further discussion however. Dr. Stavins notes that the effectiveness of his proposed policy could be influenced by factors such as the structure of electric markets and the generation mix in those markets. He also notes that policies to promote renewable energy and energy efficiency are potentially promising complements to a cap-and-trade policy.

However, these issues, noted only peripherally in Dr. Stavins' piece, really are central and should be elevated in the design of optimal climate change policy.

The first issue is market structure. Much has changed with respect to how electricity is priced and marketed since the passage of the 1990 Clean Air Act Amendments. Then, utilities were vertically integrated entities that generated electricity and delivered it to end-use customers. Rates were regulated and based on the cost to serve the customer. Today, some 17 states and more than 50% of the load in the country is served by load serving entities that no longer own generating assets and that now buy electricity on wholesale markets where prices are no longer based on the cost of providing service. In these "restructured" markets, electricity is priced at a "market-clearing price" in which the most expensive electron essentially sets the wholesale price for every electron called upon at any given time to meet demand.[2]

This is a key point in estimating the overall cost to society in achieving emission reductions, and in determining whether those costs will be borne equitably across the country. Cap-and-trade programs as well as carbon tax policies impose a price on carbon, which then increases the price of electricity.

In regulated markets, the increase will be relatively straightforward such that the cost of service is increased by the new environmental compliance cost. To the extent that non-carbon-intensive energy sources like nuclear, hydro and other renewables are available in the generation mix, the overall cost to consumers will be moderated from the price increase that would occur from coal and other carbon intensive sources in the mix.

But in restructured markets, consumers will see a magnified price impact. The relatively high compliance cost for coal and other carbon-intensive sources will set a higher generation price that will be received by all sources. Even zero carbon sources with no compliance costs will receive the increased price.

The effect here is significant. Studies show that consumers in states with power restructuring could face price increases well in excess of costs faced by ratepayers in regulated states. Generation asset owners stand to gain substantially too as the increased price for electricity brings enhanced revenues to the entire generation fleet, again, even to units that have no compliance costs. Energy consultancy Synapse finds that, "Customers in deregulated markets will pay about 10 TIMES the cost of abatement,"[3] and Sanford C. Bernstein & Co. utilities analyst Hugh Wynne says nuclear operators in deregulated states will see "supernormal profits" on the order of billions of dollars every year.[4]

Policy makers have begun to grapple with this latter issue. Auctions of allowances are being structured essentially to claw back some of the extra profits and revenues realized

1. Robert N. Stavins, *Addressing Climate Change With a Comprehensive U.S. Cap-and-Trade System*, 39 ELR (Envtl. L. & Pol'y Ann. Rev.) 10752 (Aug. 2009) (originally published at 24 Oxford Rev. Econ. Pol'y 298 (2008)).
2. Sometimes long-term contracts determine the price of some electricity delivered while short-term markets determine prices (as described here) for remaining electricity delivered.
3. Bruce Biewald, Synapse Energy Economics, Inc., Presentation to NASUCA 2008 Annual Meeting: Economics of Electric Sector CO_2 Emissions Reduction: Making Climate Change Policy That People Can Live With 22 (Nov. 18, 2008), *available at* http://www.synapse-energy.com/Downloads/SynapsePresentation.2008-11.NASUCA.Electric-CO2-Reduction-Policy.S0053.pdf (last visited May 18, 2009).
4. Rebecca Smith, *Carbon Caps May Give Nuclear Power a Lift*, Wall St. J., May 19, 2008, at A4.

through auctions recycled to the benefit of consumers in direct rebates or programs that can cut electric bills.

Note that two problems persist, however. First, since non-emitting sources do not have to buy allowances, an auction will not recover monies from them and ratepayers will still be out extra billions every year. Further, and related to this point, an uneven cost burden is still carried by consumers in deregulated states relative to those in regulated states.

Would the problem be solved if allowances were given freely to generators? No. Even if obtained at no cost, allowances have a market value since they still represent the opportunity to avoid an abatement cost. The value of these allowances will be included by generators in the price they bid into the market for their power and the magnified cost problem to consumers will remain. Emission allowances given away for free in regulated states will directly benefit consumers because cost of service will be lower than otherwise, while allowances given away for free in restructured states "will be reflected in both wholesale and retail prices whether or not they are given away for free,"[5] as electricity markets expert Paul Joskow puts it.

Perhaps it can be argued that enhanced profits to zero carbon sources is a good thing as society aims to cut greenhouse gas pollution. If so, then still another requirement is needed, namely, enhanced returns should actually be invested in projects and plants that cut emissions since paying more to existing plants is not the same thing as getting a cleaner generation built and cutting pollution further. To the extent that consumers are paying an additional price pursuant to a climate policy, climate pollution reductions should be achieved.

One potential solution to this problem is to impose the emission reduction obligation on load serving entities rather than on power generators. Power transmission and distribution is regulated in every state even if power generation is competitive. A model can be found for this approach in many state renewable portfolio standards that place the renewable energy requirement on the company delivering the power.

The second issue is the generation mix. Cost increases for electricity can reduce emissions by inducing consumers to conserve. But serious market barriers and stubborn inelasticities mean that generalized price signals only modestly affect demand. Substantial emission reductions are realized when the generating mix is switched toward lower carbon sources and, as discussed below, through targeted demand side management programs. The question then is whether carbon taxes or cap-and-trade policies are efficient or effective tools in causing a switch to non-emitting generating sources. It seems not, and fuel switching occurs only at relatively high carbon prices.

The least cost electricity is typically dispatched first. Nuclear, hydro and renewable energy sources that have low or zero fuel costs have lower marginal costs and therefore are the first generating assets to be called to serve load. This means that, to the extent these resources exist and are available, they are already running flat out. A price signal from a carbon tax or cap-and- trade policy will not result in them running more than they already are.

But what about coal and natural gas? Will price signals cause a switch in the dispatch order such that gas will run more and displace coal?

Several things are important in considering this question. Coal generation dominates many markets. That means it is needed to serve load and the plants will be run even if the cost advantage of coal compared to natural gas is diminished or disappears altogether.

To the extent gas capacity is available to serve an increased amount of load, a switch in dispatch order only occurs at carbon costs beyond those being discussed in policy and political circles today, and gas prices must be relatively low.

The regional transmission organization PJM, for example, reports that carbon charges of some $80/ton carbon dioxide ($CO_2$) are needed if combined cycle gas is to be dispatched ahead of coal on large scale when gas prices are at $10/MMBtu. Even at a gas price of $6.44/MMBtu, carbon costs of $40/ton are required.[6]

The Electric Power Research Institute (EPRI) similarly found that in the coal dominant upper Midwest of the United States, "Even a CO_2 value of $50/ton would produce only a 4% reduction in regional emissions given the current generation mix." Moreover, EPRI reports that, even in Texas, where gas is dominant, "when gas is selling for around $8MMBtu, even a CO_2 value of $40/ton produces little emissions reduction."[7]

The cost impact on consumers of carbon prices at these levels is significant. PJM for example estimates that a $60/ton CO_2 price increases wholesale power costs by 95.4%, and adds some $34 per month to household electric bills.[8]

What about "complementary policies"? Policy tools like renewable portfolio standards and efficiency performance standards can help address some of the problems noted above.

It is a truism that the shortest distance between two points is a straight line. That means that, to the extent that renewable energy and energy efficiency can cut climate-destabilizing pollution quickly and cheaply, policy should aim directly at those ends.

In Pennsylvania, climate policy is being built first on the strong foundation of policies that require the use of renew-

5. Posting of Paul Joskow to The Energy Policy Blog, http://www.energypolicyblog.com/?p=457 (Jan. 21, 2009, 22:15 EST), (last visited May 18, 2009).

6. Presentation to PJM Members Committee Meeting: Potential Effects of Proposed Climate Change Policies on PJM's Energy Market 29 (Jan. 22, 2009), *available at* http://www.pjm.com/Media/committees-groups/committees/mc/20090122-item-06-climate-change-policies.pdf [hereinafter PJM] (last visited May 18, 2009).

7. Victor Niemeyer, *The Change in Profit Climate: How Will Carbon-Emissions Policies Affect the Generation Fleet?*, Public Utilities Fortnightly, May 2007, at 24.

8. PJM, *supra* note 6, at 9.

able energy and that mandate efficiency improvements. When combined with the adoption of the California tailpipe standards for greenhouse gas emissions and efforts to enhance the sequestration of carbon in soil, Pennsylvania is finding that significant reductions in emissions on the order of 25% can be achieved and in ways that can save consumers money. Our recently passed efficiency portfolio standard, Act 129, for example, will save ratepayers some $800 million annually even as it avoids the need for 4000 MW of generating capacity and all of the associated pollution from that generation.

Various studies confirm the promise of these policies. The Regulatory Assistance Project reported last year that:

> two decades of experience with utility DSM (demand side management) programs has demonstrated in practice that well-managed *efficiency programs* can deliver significant savings to the power grid, and thus can lower carbon emissions at low cost to the nation. *In fact, the power system will realize about 5 to 7 times more savings—in MWh, and thus in GHG emissions—from each dollar spent in a well-managed efficiency program, than it will through a generalized, across-the-board price increase.*[9]

PJM backs this up. PJM's analysts report that emissions are reduced by initiatives that directly reduce demand, even while price and cost increases are mitigated. Even a modest 2% load reduction cuts three to four billion dollars from business as usual wholesale costs across the PJM region and consumers get a cut in their electric bill.[10]

Renewables offer similar cost-minimizing reductions. This is understandable since, with zero fuel costs, renewables beat out fossil generation on the margin. The more zero fuel cost generation in the mix, the more the market clearing price can be brought down, and the cheaper overall electric service will be.

PJM analysts find, for example, that adding 15,000 MW of wind displaces carbon intensive generation and reduces emissions, while mitigating the price and cost of achieving those emission reductions. Cost savings in achieving emission reductions are estimated to be on the order of some four to four and a half billion dollars in wholesale power prices across the PJM region.[11]

Summing up the benefits of renewables and efficiency, PJM reports that "penetration of actions that reduce consumption and wind power have mitigating effects on LMP (locational marginal pricing), wholesale power costs, and customer bills while enhancing emissions reductions."[12]

In conclusion, cap-and-trade is a proven tool in achieving cost effective pollution reductions. Dr. Stavins' design will ensure it can play a similarly effective role in helping society meet the climate challenge. However, other policy tools offer considerable promise in achieving needed emission cuts even at a cost savings to consumers. Emphasizing these policies also mitigates some of the magnified cost and inequity issues that arise across the various electricity market designs across the county. Policies that increase use of renewable electricity and energy efficiency should be given more central stage in crafting a comprehensive climate mitigation policy.

9. *Carbon Caps and Efficiency Resources: How Climate Legislation Can Mobilize Efficiency and Lower the Cost of GHG Regulation*, 110th Cong. 8 (2008) (testimony of Richard Cowart, Director of the Regulatory Assistance Project, House Select Committee on Energy Independence and Global Warming), *available at* http://globalwarming.house.gov/tools/2q08materials/files/0024.pdf (last visited May 18, 2009).
10. PJM, *supra* note 6, at 18.
11. *Id.* at 22.
12. *Id.* at 29.