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The coming carbon market and its impact on the American economy

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Abstract

The likely centerpiece of U.S. legislation to address climate change will be a cap-and-trade program that creates a market for greenhouse gases (GHGs). Whether the onset of a cap-and-trade system and additional complementary policies would provide a benefit or a cost to our economy has been the subject of much modeling and debate. This paper argues that while climate policy does not come without cost, modeling of the Lieberman–Warner Climate Security Act demonstrates that these costs are not substantial and can be mitigated by appropriate policy design. Finally, while a well-designed carbon market will be a large factor in lowering costs and driving innovation, complementary policies will be necessary to induce the technological change required to transition the United States to a low-carbon economy.

Keywords: Climate change; Carbon market; Economic models; Economy; Impacts; Technology

1. Introduction

Climate change is the environmental issue of the century. Interest in addressing this problem has grown in all quarters of our society, from politicians and industry to the average consumer. With the recent financial markets turmoil and deepening recession however, the economy has taken center stage, and many believe that passing comprehensive U.S. climate legislation will be difficult, if not impossible, in 2009. This belief is based in part on the concern that such legislation will impose significant—and politically unpalatable—economic costs. At the same time, many proponents of climate policy argue that it can provide a critical stimulus to transform our aging energy infrastructure and to grow our economy.

The objective of this paper is to explore these potential cost and benefit implications of climate policy on the U.S. economy. We first provide a brief primer on cap and trade, and then discuss the current momentum behind the development of the carbon markets in general and domestic climate policy in particular. Next we present insights from economic models, and finally conclude with an examination of how carbon price signals in combination with complementary policies can transform both investment and technology innovation to lower program costs and stimulate economic growth.

2. A cap-and-trade primer

The centerpiece of comprehensive climate legislation will likely be a cap-and-trade program that creates a market for greenhouse gas (GHG) emissions. Emissions trading, which has been used to combat several environmental

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problems such as acid rain (SO_2) and the deterioration of the ozone layer, has emerged as a tool of choice to address climate change. Internationally, trading is a fundamental element of the Kyoto Protocol, the EU climate program, and proposed programs in both Australia and New Zealand. In the United States, 24 states are in the process of developing GHG cap-and-trade programs, and from 2007 through 2008, 10 bills were put forward in the 110th Congress that would have established a national GHG cap-and-trade program.

These programs operate by first setting a ''cap'', or limit, on the amount of GHGs that regulated firms are allowed to release. A GHG ''allowance'' is created for each ton of capped emissions, and these allowances are distributed to firms and other entities either through an auction or free allocation—or some combination of the two. While these allowances can be traded to other market participants, at the end of each compliance period, regulated firms must surrender allowances to the government equivalent to their GHG emissions (''emissions''). Trading gives firms covered by the regulation the flexibility either to reduce their own emissions or to buy allowances from another firm. This process minimizes the overall economic cost of the program, as it provides an incentive for firms with the lowest marginal cost of abatement to make the cheapest reductions first.

One of the central features of a cap-and-trade system is that it creates a price on emissions (commonly referred to as a carbon price).[1] Ensuring that industry and consumers see this price signal and factor it into their decision making is essential to create the incentive to reduce emissions and to invest in low-carbon technologies. A common criticism of cap and trade, however, is that while the emissions cap creates a level of environmental certainty, because the resulting carbon price is set by the market and thus variable, the ultimate program cost is uncertain.

While this criticism has some validity, a variety of policy design elements can be utilized to help ensure that program costs are manageable and dampen price volatility. Likely the most important factor affecting the program's cost is the stringency of the cap over time. Requiring drastic reductions in the near term will be much more costly than a more gradual reduction schedule, yet at the same time, less stringent targets in the early years will require much greater reductions in the longer-term. The ability to bank or borrow allowances and utilize emission offsets will reduce program costs and can help firms manage price volatility.[2] The method of initial allowance distribution will also affect both the distribution of costs across regulated entities and potentially the overall cost of the program. For example, providing some number of free allowances to regulated entities would decrease compliance costs to those participants, but this could also increase the overall macroeconomic costs of the program compared to option of auctioning allowances and using the revenue to displace distortionary taxes on capital and labor (CBO, 2007). These cost concerns are examined in more detail later in the paper, but first we will explore the growing momentum behind establishing a mandatory carbon market in the United States.

3. Carbon market momentum

Increasing GHG regulation has caused the value of the global carbon market to more than double from around $31 billion in 2006 to $64 billion in 2007 (World Bank, 2008).[3] The EU Emissions Trading Scheme (EU-ETS) is the dominant market overall, accounting for approximately 69% of the total volume and 78% of the value of all trades. Offset mechanisms within the Kyoto Protocol, the Clean Development Mechanism (CDM) and Joint Implementation (JI), account for much of the remaining volume and market value.[4] Since the United States has yet to enact a mandatory national climate program, all domestic carbon market transactions are currently voluntary, including the members-only trading program established by the Chicago Climate Exchange (CCX).[5] Yet, while there has been a lack of action at the national level, many states are in the process of developing either individual state or regional GHG emission trading efforts.

[1] ''GHG allowances'' are often referred to as ''carbon allowances'' because GHG emissions are measured in units of carbon dioxide equivalent in order to account for the differing global warming potentials of the various gases. Similarly, the price of GHG allowances is often referred to as the ''price of carbon''. While the authors recognize that the use of the word ''carbon'' is not scientifically accurate, its has become part of the common climate lexicon.

[2] For more information on the major issues involved in developing cap-and-trade and cost containment policy options, see the Pew Center's Congressional Policy Brief series at http://www.pewclimate.org/DDCF-Briefs.

[3] The voluntary market, which is only about 2.2% of the volume and 5% of the value of the regulated market, is not a focus of this paper.

[4] For more detailed information on the status of the carbon market consult sources such as Point Carbon, New Energy Finance, and the World Bank.

[5] CCX has been operational since 2003 with current membership near 300 and an emission reduction goal for all members of 6% below a 2001 baseline by 2010. In October of 2008 the market was clearing at a price of about $1.25 per metric ton.