

Implications of carbon cap-and-trade for US voluntary renewable energy markets

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Abstract

Many consumers today are purchasing renewable energy in large part for the greenhouse gas (GHG) emissions benefits that they provide. Emerging carbon regulation in the US has the potential to affect existing markets for renewable energy. Carbon cap-and-trade programs are now under development in the Northeast under the Regional Greenhouse Gas Initiative (RGGI) and in early stages of development in the West and Midwest. There is increasing discussion about carbon regulation at the national level as well. While renewable energy will likely benefit from carbon cap-and-trade programs because compliance with the cap will increase the costs of fossil fuel generation, cap-and-trade programs can also impact the ability of renewable energy generation to affect overall CO₂ emissions levels and obtain value for those emissions benefits. This paper summarizes key issues for renewable energy markets that are emerging with carbon regulation, such as the implications for emissions benefits claims and voluntary market demand and the use of renewable energy certificates (RECs) in multiple markets. It also explores policy options under consideration for designing carbon policies to enable carbon markets and renewable energy markets to work together.

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1. Introduction

Voluntary markets for renewable energy, or “green power markets,” provide an avenue for consumers to support the development of renewable energy sources by enabling them to choose cleaner electricity sources for their own energy consumption. This market is important in that it empowers consumers to affect the resources used to supply their own energy needs. While, initially, most green power products targeted residential consumers, recent growth in voluntary markets has been primarily fueled by large purchasers, including Fortune 500 companies and other businesses,

universities, and government agencies, such as Intel, Pepsico, the US Airforce, and Wells Fargo.¹

As a result of increased interest among the nonresidential sector, voluntary markets are growing rapidly. In recent years, sales of renewable energy in voluntary markets have increased by nearly 50% annually. At the end of 2006, voluntary consumer purchases of renewable energy totaled 12 million megawatt-hours (MWh) with a large fraction of the purchases by nonresidential customers (Bird et al., 2007). In comparison, state renewable energy standards, which are a primary policy driver for renewable energy development in the US, called for approximately 20 million MWh of new renewable energy generation in 2006, according to estimates from the Union of Concerned

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¹See the US Environmental Protection Agency’s Green Power Partnership web site for a list of organizations that voluntarily purchase renewable energy: <http://www.epa.gov/greenpower/toplists/top25.htm>.

Scientists (Swezey et al., 2007). Thus, voluntary markets help to support a significant fraction of new renewable energy generation in the US alongside existing state policies.

While there are a number of benefits of renewable energy sources, many consumers have been motivated, at least in part, to purchase renewable energy because of its greenhouse gas (GHG) benefits. Currently, purchasing green power is an accessible and relatively easy and transparent way in which customers can reduce their carbon footprints. Most utilities and independent marketers that offer green power options promote their products by touting the GHG benefits and, in fact, some marketers actually sell carbon reductions derived from renewable energy generation to enable consumers to “offset” the carbon dioxide (CO₂) emissions associated with their electricity consumption, car and plane travel, and home heating energy use. Likewise, many purchasers point to the GHG benefits of their green power purchases in news releases and other promotional materials.

Emerging carbon regulation in the US has the potential to substantially affect voluntary markets for renewable energy. Carbon regulation is now developing under the Regional Greenhouse Gas Initiative (RGGI, pronounced “Reggie”) in the Northeast, the Western Climate Initiative, and the Midwestern Greenhouse Gas Reduction Accord. There is increasing discussion about carbon regulation at the national level as well. To achieve GHG reductions, the regional initiatives plan to implement cap-and-trade programs, which would enable emitters to trade allowances to meet emissions targets. There is precedent for using cap and trade to control emissions, such as the successful national sulfur dioxide (SO₂) cap-and-trade system developed under the Clean Air Act Amendments of 1990 to address acid rain.

In general, renewable energy will benefit from carbon cap-and-trade programs because compliance with the cap will increase the costs of fossil fuel generation, which will improve the cost-effectiveness of renewables and may provide an incentive to capped entities to use renewable energy to meet future load growth. However, the level of the incentive provided for renewables will depend on the stringency of the cap; a loose emissions cap may provide little financial incentive for renewables.

Cap-and-trade programs can also impact the ability of renewable energy generation to affect overall CO₂ emissions levels, depending on the design of the program. If renewable generation sources are not accounted for under the cap (through the retirement of allowances or in setting the level of the cap), then they will not affect the overall level of CO₂ emissions, and purchasers of renewable energy have no basis for claiming overall emission reductions. This is particularly problematic under a loose cap, where renewable energy markets could offer one avenue for further CO₂ reductions. However, if these markets are not given the opportunity to do so (due to the design of the cap-and-trade programs) renewable markets could be comprised. Therefore, the implementation of carbon cap-

and-trade programs has important implications for voluntary renewable energy markets.

These same issues also pertain to other types of cap-and-trade programs, such as those for SO₂ and NO_x, but carbon cap-and-trade programs have more significant implications for renewable energy markets. This is true because renewable energy sources offer one of the few options for generating electricity without CO₂ emissions and carbon capture and storage technologies are still under development. In addition, consumers may be more interested in achieving reductions in GHG emissions than emissions of specific air pollutants such as NO_x and SO_x. Furthermore, carbon regulation is beginning to emerge, while emissions trading markets have already been established for SO₂ and NO_x.

This paper focuses primarily on the potential effects that emerging mandatory carbon markets will have on voluntary renewable energy markets. First, the paper examines the extent to which GHG benefits motivate consumers to make voluntary renewable energy purchases, and the claims that large commercial and institutional consumers currently make regarding their purchases. Next, the paper summarizes key issues emerging as a result of these overlapping markets, such as the implications for renewable energy marketing claims, the demand for and price of renewable energy certificates (RECs), and the use of RECs in multiple markets (disaggregation of attributes). Then, it describes carbon regulation programs under development in the US, with particular emphasis on the RGGI in the Northeast, and how such programs might affect renewable energy markets in these regions. Finally, the paper presents policy options for policymakers and regulators to consider in designing carbon policies to enable carbon markets and voluntary renewable energy markets to work together.

2. Climate change as motivator for green power purchasers

There are a number of reasons why consumers buy green power, including environmental benefits (air pollutant and GHG emissions), health benefits, fuel diversity, energy security, local economic development, encouraging the development of new technologies, resource protection for future generations, and energy price stability; and, for nonresidential consumers, public relations benefits. (Holt and Wisner, 1999; Holt et al., 2001; Blank et al., 2002; Hanson, 2005)

Residential consumers, in particular, purchase renewable energy for a variety of reasons,² so it is difficult to discern the relative importance of GHG benefits as a motivator.

²A recent poll of residential customers sponsored by the US Department of Energy found that consumers have a variety of reasons for purchasing or wanting to purchase renewable energy. Respondents indicated the following reasons: to improve today's environment (32%), to leave our children and grandchildren a cleaner environment (30%), to improve US energy security (24%), to support the development of new technology (23%), to create local jobs and improve the economy (21%), to protect against fuel price increases (20%), all of these (58%) (Opinion Research Corporation, 2006.)

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