ЗМІСТ

Trading in air: mitigating climate change through the carbon markets

Анотація

Trading in Air provides a comprehensive insight into opportunities and challenges to achieve greenhouse gas emissions reductions through the carbon markets, with a focus on transition economies.

Chapter I tracks the evolution of the global carbon markets.

Chapter II discusses the legal framework under the UNFCCC and Kyoto Protocol.

Chapter III explores emissions reduction projects under Article 6 of the Kyoto Protocol and, among other things, uses Russia s approach to implementing JI projects as an illustration. Chapter IV considers the future of climate regulation after 2012.

The book is an indispensable working tool for regulators, market participants, and other parties interested in climate regulation.

FOREWORD

Over the past two decades, the international community has developed a regulatory framework for reducing anthropogenic greenhouse gas emissions, which have been recognized as the main culprit behind climate change. This framework, codified in the Kyoto Protocol, employs cap-and-trade as the primary platform for achieving cost-effective emission reductions. The carbon markets play a central role in this process. Yet the carbon markets extend well beyond Kyoto to other regional and domestic programs aimed at curbing emissions.

One of the main functions that Kyoto and these other markets play is that of facilitating emissions reductions in developing countries and in transition economies in Central and Eastern Europe. The potential for slashing greenhouse gas emissions in these countries is immense, and still largely unrealized. To successfully meet this potential, it is important to navigate among the various systems of climate regulation in place today, to understand how they work, and to recognize and manage the various levels of risk involved in developing emission reduction projects.

This book describes the opportunities for and challenges to achieving greenhouse gas emissions reductions through the carbon markets, with a focus on developing and transition economies. Chapter One sets the landscape by tracing the evolution of the carbon markets, from the first pilot programs in Denmark and the UK, to the combination of international, domestic, and voluntary markets in place today. Chapter Two details the development of the UNFCCC and Kyoto Protocol, and provides a guide to the principal obligations and themes set forth in these agreements. Chapter Three turns to the specific challenges that market participants and government regulators often face in developing emission reduction projects. This chapter offers suggestions on how to work within diverse international and domestic legal structures and realities, to manage risk, and to bring projects to successful fruition. Chapter Four looks ahead to trends in international climate negotiations, with an eye on the form that future climate regulation may take after 2012.

The authors of this book are three attorneys, who bring to this project years of experience in the field of international climate law and policy. Max Gutbrod is a partner, and Sergei Sitnikov is a senior associate, at the law firm of Baker & McKenzie in Moscow. Max Gutbrod and Sergei Sitnikov are deeply involved in legal support of Kyoto-related projects in Russia, and are advising government and private entities on related legislation. Edith Pike-Biegunska is an Energy and Environment Fellow at The Regulatory Assistance Project in Montpelier, Vermont, where her work focuses on utility-sector reform in the US and Europe. She has worked extensively on climate and energy policy both in the US and Russia.

With this book, we hope to provide a useful guide to navigating the carbon markets for market participants, regulators, and other interested parties. We aspire to provide the reader with a firm grasp on the scope and structure of the global markets, and on the regulatory schemes and legal requirements underpinning them. We offer a range of risk management options to facilitate successful development of greenhouse gas emission reduction projects, and more broadly, to support the monumental task of combating climate change on a global scale.

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CHAPTER 1 – Rise of the carbon markets

A. Introduction

Carbon trading lies at the center of global climate policy today. A web of domestic and international carbon markets has emerged around the world, representing a powerful regulatory and market force. These markets have the potential to yield significant environmental benefits while offering financial opportunities. Carbon markets can help meet stringent emission reduction targets by minimizing the overall cost of compliance. Putting a price on pollution and allowing emitters to trade pollution allowances and credits creates financial opportunities for (1) those able to reduce emissions cheaply, and (2) for other market players such as low-carbon project developers and market intermediaries. In 2007, the three largest global carbon markets generated an estimated volume of 2,983 megatons of greenhouse gas emissions reductions, measured in CO_2 equivalent.[2] Total market activity in the same year was valued at over $64 billion.[3]

This chapter examines the current state of the global carbon markets. It first provides an overview of the general characteristics common to carbon markets around the world. Next, it discusses the advent of regional carbon markets in countries with no national GHG mitigation policies. These markets have served as testing grounds for innovation in carbon trading. It then explores the growth of national GHG cap-and-trade programs and their role in international climate mitigation. Thereafter, it introduces the two leading global carbon markets in place today: the Kyoto Protocol market and the European Union's Emissions Trading Scheme. Finally, the discussion turns away from cap-and-trade to the role of voluntary emission reduction standards in curbing GHG emissions around the globe. These markets both supplement

[2] The significance of measuring GHG emissions reductions in CO_2 equivalent is discussed in section B.II.1 of this chapter.

[3] The World Bank, "State and Trends of the Carbon Market, 2008," 1 (May, 2008) (hereinafter "World Bank 2008"). Available at http://siteresources.worldbank.org/NEWS/Resources/State&Trendsformatted 06May10pm.pdf.

mandatory emissions reduction schemes and illustrate the growing linkage between various carbon markets around the globe.

B. General carbon market characteristics

Despite the proliferation of cap-and-trade to address climate change, there is no single system of regulation and, correspondingly, no global carbon market. Instead, there are a number of markets, playing by similar but materially different rules, with various levels of interaction. Still, on an elemental level, each carbon market shares similarities, both in the structure of the cap-and-trade scheme and in the design elements of the market itself.

Implementing a system of cap-and-trade regulation involves four basic steps. First, a regulator sets a limit on – or "caps" – total emissions. Second, it distributes a fixed number of emissions allowances to regulated entities. The total number of allowances distributed should correspond to the overall emissions limit, while the number of allowances distributed to each entity represents that party's emission target within the cap. Third, the regulated entities are allowed to meet their targets by reducing emissions, and by buying and selling allowances – the "trade." Fourth, at the end of the trading period, parties surrender enough allowances to cover their actual emissions and are subject to penalties for noncompliance. While in reality cap-and-trade systems tend to involve more complex structures, the basic steps of setting a cap, distributing allowances, trading, and final accounting, remain unchanged. The following discussion explores the details of cap-and-trade in more depth.

I. The cap

A number of important elements enter into the design of the cap itself. These can be summarized as follows:

- Which gases to cover;
- Which sectors to regulate;
- The stringency of the cap; and
- The length of the compliance period.

1. Gases and sectors covered

There are a number of greenhouse gases. The four principal anthropogenic GHG gases responsible for climate change are: carbon dioxide (CO_2),

methane (CH_4), nitrous oxide (N_2O), and halocarbons.[4] Each greenhouse gas exhibits the ability to trap heat in the Earth's atmosphere. While the potency of each gas varies – some have a greater ability to trap heat than others – all contribute to climate change. Some cap-and-trade systems have limited their coverage of regulated GHGs within the cap to CO_2, which is the most prolific anthropogenic GHG. However, the Kyoto Protocol covers three of the greenhouse gases listed above, CO_2, CH_4, N_2O, as well as three other potent greenhouse gas categories: sulphur hexafluoride (SF_6), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs).[5]

As mentioned earlier, human-induced GHG emissions originate from all economic sectors world-wide. In theory, a cap-and-trade scheme that covered all gases and all global economic sectors would lead to the most cost-effective emissions reductions. This is because the more regulated entities there are, the more selection market players have to locate the cheapest reductions available. Furthermore, including all emitters would eliminate the problem of leakage – that is, that reductions within the cap would be countered by corresponding increases in emissions in unregulated areas.

In reality, political barriers have prevented reaching a truly global agreement on climate change. Furthermore, practical considerations have called for focusing on the gases and sectors that are both most broadly responsible for climate change and for which emissions reductions are easiest to track. For example, some of the economic sectors most responsible for climate change include electricity generation, buildings, and transportation. Focusing on reducing GHG emissions in these sectors can help streamline resources in a way that maximizes the effects of regulation at the least cost.

2. Stringency of the cap and length of the compliance period

In addition to including key gases and sectors, setting the cap at an effective level is crucial to achieving climate change goals. This means establishing the cap at a level that requires significant emissions cuts without representing an unattainable target. The Kyoto Protocol and other cap-and-trade schemes have been criticized for setting low targets, and therefore doing too little to combat

4 IPCC, "Climate Change 2007 the Physical Science Basis," Contribution of Working Group I to the Fourth Assessment Report of the IPCC, 135 (Cambridge University Press 2007) (hereinafter "IPCC 2007"). Available at http://www.ipcc.ch/

5 Kyoto Protocol, *supra* note 1.

climate change. Certainly, future caps will have to be more stringent to reduce emissions to the suggested level of 50–80% below 1990 levels by 2050.[6]

In order to set realistic goals, and to adjust to new technologies and scientific findings regarding climate change, caps are set for relatively short time periods. For example, the Kyoto Protocol establishes a five-year commitment period for meeting its goal of reducing GHG emissions to 5% below 1990 levels between 2008 and 2012. The Chicago Climate Exchange establishes two, four-year commitment periods; and the Regional Greenhouse Gas Initiative in the US sets a cap that increases in stringency over time. Setting caps at intervals allows regulators to balance the importance of swift action on climate change with the need for technological innovation and dissemination, as well as the need to adjust to scientific developments in how we understand the effects of GHG emissions on the climate.

II. The trade

Establishing a well functioning trading system requires careful attention to a number of design elements. Most carbon markets do not specify how, precisely, carbon trading is to occur. Indeed, they tend to leave development of a trading platform and other important market details open for participants to elaborate themselves. Still, in order for a carbon market to function effectively, regulators must put in place a number of central elements. These include:

- Standard units of trade, which may include emissions allowances and offset credits;
- A system for apportioning emissions allowances;
- Monitoring and verification standards to ensure the integrity of offset credits; and
- A system for tracking and recording the movement of trading units within the system.

1. Standard units of trade

There are two general types of emissions trading units within the global carbon markets: allowances and credits. In each trading period, the regulator distributes a total number of allowances among regulated entities that corresponds to

[6] IPCC, "IPCC Third Assessment Report – Climate Change 2001" (Cambridge University Press 2001). Available at http://www.ipcc.ch/ipccreports/assessments-reports.htm.

the cap. Each entity then has the choice to (1) reduce emissions to the level covered by its allowances; (2) buy additional allowances to meet any shortfall; or (3) sell allowances if it manages to bring its emissions below the allocated allowance amount. Carbon credits, on the other hand, are generated through emission reduction projects. These credits are often referred to as "offsets," as they allow a regulated Party to offset its emissions within the cap with emissions reductions achieved outside the cap. Offset credits provide parties a fourth option to help meet their targets – through generation or purchase of offset credits. Today most cap-and-trade systems include an offset mechanism.

For the market to function fluidly, allowances and credits must be interchangeable. This requires that each allowance and credit represent the same volume of GHG emission reductions. There has been some coordination in standardizing units of trade within the global carbon markets. Today the general standard measure for carbon allowances and credits is 1 ton of CO_2 equivalent ("1 tCO_2e"). This is an important point, because greenhouse gases exhibit varying levels of global warming potential.[7] For example, methane carries 23 times the global warming potential of CO_2.[8] Therefore reducing one ton of methane has the same effect on global warming as reducing 23 tons of CO_2. Correspondingly, reducing one ton of CO_2 generates 1 tCO_2e, while reducing one ton of CH4 generates 23 tCO_2e. By standardizing the units of trade, regulators can track emissions reductions based on their warming effect in terms of CO_2e, and parties can generate and trade credits in a currency that all market players can understand and value.

While a market can function without offset credits, offsets play an important role in the carbon markets today. Offsets provide a number of benefits. First, they facilitate compliance by crediting emissions reductions achieved outside the cap, where reducing emissions is often cheaper. Second, offsets offer an opportunity to expand the scope of emissions reductions to unregulated sectors and countries. Third, reducing emissions in developing countries, where reductions are often cheapest, can help contribute to sustainable development along a low-carbon path.

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[7] Chlorofluorocarbons and other ozone-depleting chemicals also have a warming effect; however, as they are already regulated by the global Montreal Protocol on the Substances that Deplete the Ozone Layer, they fall outside the scope of climate change regulation. *See* Kyoto Protocol, *supra* note 1, Article 5.

[8] In Decision 2/CP.3, the parties to the UNFCCC clarified that parties should use the global warming potential provided in the IPCC's Second Assessment Report, based on the effects of greenhouse gases over 100 years. Decision 2/CP.3, FCCC/CP/1997/7/Add.1 (March 25, 1998). Available at http://unfccc.int/resource/docs/cop3/07a01.pdf.

There has been some controversy over the use of offsets. Critics have often focused on two concerns: the integrity of offset credits, and the fear that offsets let regulated entities pollute more, not less. Criticism has centered on lax standards and inaccurate accounting of emissions reductions as undermining the integrity of offset credits. The factors required to accurately measure emissions reductions are discussed in more detail shortly. The second concern arises from the worry that by investing in unlimited emission reduction projects outside the cap, capped entities can pollute indiscriminately within the cap, defeating the purpose of the cap-and-trade scheme. In theory, offsets should not undermine global climate change efforts. GHG emission reductions have the same effect on climate change, regardless of where they occur. That is, a reduction of 1 tCO_2e in the UK has the same effect as reducing 1 tCO_2e in China or anywhere else. Still, because climate change poses a pressing challenge, it is important to continue to stimulate innovation of new technologies in developed countries that face mandatory emission reduction targets. Unlimited offsets have the potential to stymie such growth by diverting resources to quick-fixes in developing countries. It is possible to mitigate the worries over offsets through tighter caps and limits on offset credits.

2. Apportioning emissions allowances

There are two basic methods for apportioning emissions allowances: (1) through an auction; and (2) free of charge. Many authorities point out that auctioning allowances is an efficient form of cost-distribution. The revenues from the auction allow the regulator or government to distribute resources in a way that helps minimize the impact of higher prices on vulnerable parties such as small businesses and the poor. Auction proceeds can also provide funding to help eliminate barriers to clean technologies, which face initial hurdles but often result in net gains over time.

The main resistance to auctions comes from regulated entities. Auctions impose upfront costs on the parties covered by the cap. Yet over time the cap-and-trade system rewards firms with efficient operations who can then sell their excess allowances, and buys inefficient firms time to improve their operations.[9] Despite their benefits, auction proposals have met sharp resistance, and most cap-and-trade schemes still distribute the bulk of allowances free of charge.[10]

[9] For a discussion of the arguments surrounding allowance auctioning, *see* Reinaud and Philibert, "Emissions Trading Trends and Prospects," International Energy Agency (December 2007). Available at http://www.iea.org/papers/2007/ET_Trends&Prospects.pdf.

[10] For example, Phase II of the European Union's Emissions Trading Scheme allows participating countries to auction a maximum of 10% of allowances.

3. Monitoring and verification standards

As mentioned above, the quality of carbon credits depends on their accurate reflection of emissions reductions. Because the overall goal of a cap-and-trade system is to reduce emissions, it is vital to prove that carbon credits represent real emissions reductions.

Three factors enter into proving the credibility of emissions reductions. First, it is vital to set an accurate starting point, or baseline, against which to measure reductions. Second, emissions reductions must be additional to those that would have occurred absent outside intervention. That is, they must represent a deviation from a baseline or business-as-usual ("BAU") scenario. This concept is referred to as "additionality." Third, emissions reductions must be monitored and verified by independent entities to ensure their accuracy.

These three criteria: baseline, additionality, and monitoring and verification, are central to ensuring that carbon credits represent something of value. Carbon credits have value when they represent emissions reductions that, under a cap-and-trade scheme, help parties meet their compliance targets, and more broadly, when they help meet the goal of fighting climate change. Without accurate transparent standards to ensure these criteria, carbon trading becomes nothing but a system for trading in hot air.

4. Tracking the movement of allowances and credits

Keeping track of emissions allowances and credits is central to maintaining a sound cap-and-trade system. Within any given emission trading period, carbon units have a fixed life cycle that begins with their creation and ends with their retirement. In between, regulated entities buy and sell allowances and credits to help meet their emission reduction targets. At the close of the trading period, each regulated entity must retire enough units to cover its emissions in order to comply with its target. Parties can also, under certain systems, bank any leftover surplus allowances and credits for use in future commitment periods.

The creation, transfer, and retirement of carbon allowances and credits are tracked through an emissions registry. Each registry has its own rules, but the general mechanics remain the same. The registry first registers qualifying allowances or credits, marking each unit with a unique serial number that will remain unchanged throughout its life cycle. These units are generally kept in

accounts – much like money in a bank – held by participants in the system. Transfers into and out of accounts are tracked and recorded to ensure that there is no double-counting.

Carbon allowances and credits can end their tenure within a registry in a number of ways. Chiefly, they exit the registry when they are retired to comply with a party's emission target. Under some systems, anyone can purchase carbon credits and take them out of circulation, thereby reducing overall emissions within the cap. Credits can also be transferred from one system to the next for their conversion into different trading units. For example, Climate Reserve Tons, carbon credits generated under the California Climate Action Registry ("CCAR"), can be transferred to the Voluntary Carbon Standard's registry and converted into Voluntary Emissions Reductions. As various carbon trading systems link together, the frequency of this type of transaction will likely grow.

The main cap-and-trade schemes in place today lay the groundwork for emissions trading, but do not specify a forum or actual methodology to guide trading. So long as parties comply with the legal requirements for baselines, additionality, monitoring and verification, and for recording transactions in the official register, they can trade emissions as they see fit. This has led to a flurry of market innovation. Today carbon trading occurs on new exchanges such as the European Climate Exchange, and pre-existing platforms such as ICE Futures Europe. Trades have further evolved from informal spot markets to include forward markets and trading on securities and commodities exchanges.[11]

The following discussion provides an overview of some of the primary carbon markets that have emerged around the world. It focuses on the distinguishing characteristics of these markets, rather than on elaborate analysis of market details, in order to illustrate the diversity of carbon market development. The aim is to identify some of the main trends in carbon market development. These trends play a vital role as the carbon markets continue to develop, and the links between them grow stronger.

[11] *See, e.g.,* Richard Sandor et al., "Creating a Market for Carbon Emissions: Gas Industry Opportunities," *Natural Gas* 6 (1999). Explaining a seven-stage process for market development which begins with creation of demand for a market and establishment of uniform standards for a commodity or security, to the emergence of informal spot markets, followed by securities and commodities exchanges, and other market innovations leading to the proliferation of over-the-counter markets. Available at http://www.envifi.com/Bios/natgas.htm.

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