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*Regulating a Carbon Market: Issues Raised By the European
Carbon and U.S. Sulfur Dioxide Allowance Markets*

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Division

April 30, 2008

Abstract. This report examines the ETS and Title IV sulfur dioxide cap-and-trade program, with a focus on the market activity and the current regulatory overlay. From that discussion, observations are drawn about implications for regulating a future greenhouse gas trading scheme in the United States. No current U.S. cap-and-trade proposal has specific provisions with respect to carbon allowance financial instruments or who would regulate such a market or its participants.

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CRS Report for Congress

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April 30, 2008

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Prepared for Members and
Committees of Congress

Regulating a Carbon Market: Issues Raised by the European Carbon and U.S. Sulfur Dioxide Allowance Markets

Summary

Both the European Union's Emissions Trading Scheme (EU-ETS) and the U.S. Title IV sulfur dioxide (SO₂) program provide insights into regulatory issues that may face any future U.S. carbon market. From the initial operations of the EU-ETS, the 2006 price crash raised questions about the adequacy of market regulation. In particular, some suspect that information about allocations leaked before official publication, and that certain traders profited from this knowledge.

Title IV's longer trading history reveals two important trends: (1) an increasing trend toward diverse and non-traditional participants that is likely to continue under a carbon market; (2), an increasing use of financial instruments to manage allowance price risk that is likely to expand under a carbon market as a hedge against price uncertainty. Indeed, a carbon market may look more like other energy markets, such as natural gas and oil, than the somewhat sedate SO₂ allowance market.

Regulation of emissions trading would have to consider two kinds of fraud and manipulation: fraud by traders or intermediaries against other investors, and sustained price manipulation. Four agencies could have roles in the regulation of an emissions market, each with its own attributes that may contribute to effective regulation.

The Commodities Futures Trading Commission (CFTC) currently oversees the Title IV program and its current mission most closely resembles what a regulator of a future carbon market would do, including experience in market surveillance to prevent or detect fraud and manipulation. The major failing of the CFTC, according to some, is that it lacks the resources and the statutory mandate to do its job.

The Securities and Exchange Commission (SEC) is much larger than the CFTC, and its enforcement programs are considered more effective than the CFTC's. While the CO₂ market will resemble commodities markets more closely than securities, SEC has some appropriate regulatory tools applicable to an emissions market.

The Environmental Protection Agency (EPA) would likely be responsible for the primary market in allowances. However, EPA lacks experience comparable to that of the CFTC and SEC in regulating trading markets, although the data it gathered in the primary market could be critical to oversight of the secondary market.

Federal Energy Regulatory Commission (FERC) was granted oversight authority over bulk electricity and interstate natural gas markets in 2005. Its experience with market surveillance and enforcement is thus limited in comparison to the SEC and CFTC, and it does not play an active role in overseeing the Title IV market.

It is possible that no single regulator would have clear jurisdiction, as is the case in the Title IV program. This kind of regulatory fragmentation has not always worked well. An umbrella group to monitor markets and provide a forum for regulatory coordination might help to prevent regulatory gaps or conflicts in the market.

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Regulating a Carbon Market: Issues Raised by the European Carbon and the U.S. Sulfur Dioxide Allowance Markets

Introduction

A number of congressional proposals to advance programs that reduce greenhouse gases have been introduced in the 110th Congress. Proposals receiving particular attention would create market-based greenhouse gas reduction programs along the lines of the trading provisions of the current sulfur dioxide (acid rain) reduction program established by Title IV of the 1990 Clean Air Act Amendments.¹ These “cap-and-trade” schemes would impose a ceiling (cap) on total annual emissions of greenhouse gases and establish a market in pollution rights, called allowances, between affected entities. An allowance would be a limited authorization by the government to emit one metric ton of carbon dioxide equivalent (CO₂e), and could be bought and sold (traded) or held (banked) by participating parties.

These domestic proposals have parallels with the programs being implemented in Europe to meet its obligations under the Kyoto Protocol. Specifically, the European Union (EU) has decided to implement a cap-and-trade program, along with other market-oriented mechanisms permitted under the Kyoto Protocol, to help it achieve compliance at least cost.² The EU’s decision to use emission trading to implement the Kyoto Protocol is at least partly based on the successful emissions trading program used by the United States to implement its acid rain control program.

These two operating cap-and-trade programs — the U.S.’s acid rain program and the EU’s climate change program — may provide insights for the design of a domestic greenhouse gas reduction scheme.³ However, while the experiences of the EU system directly relate to the greenhouse gas reduction initiative of the domestic legislative proposals, it has operated only a short time (see text box). The acid rain control program has a longer operating history, although the control scheme differs

¹ P.L. 101-549, Title IV (November 15, 1990).

² Norway, a non-EU country, also has instituted a CO₂ trading system linked to the EU-ETS. Various other countries and a state-sponsored regional initiative located in the northeastern United States involving several states are developing mandatory cap-and-trade system programs, but are not operating at the current time. For a review of these emerging programs, along with other voluntary efforts, see International Energy Agency, *Act Locally, Trade Globally* (2005).

³ Other U.S. cap-and trade programs exist — most notably the nitrogen oxide program developed by EPA in the late 1990s.

in some important ways — e.g., it is internal to one nation and involves fewer types of sources.

Among the lessons that Phase 1 of the European Trading System may have for a similar U.S. program is that allowance prices are linked to the price of other energy commodities.⁴ Analysis of ETS allowance prices during Phase 1 suggests the most important variables in determining allowance price changes have been oil and natural gas price changes.⁵ For example, when natural gas, the cleaner fuel, becomes more expensive relative to oil, industrial users may switch to oil, creating increased demand for allowances. This suggests that traders will pursue arbitrage strategies involving simultaneous transactions in allowances and oil and gas contracts. For example, a trader anticipating a rise in the price of oil might take a position in allowances in the expectation that the two prices would move in tandem. Since there is widespread suspicion that excessive speculation by hedge funds and others has affected energy prices in recent years,⁶ the possibility that the price of allowances could also be subject to distortion or manipulation will be a policy concern.

The EU's **Emissions Trading System** (ETS) covers more than 12,000 energy intensive facilities across the 27 EU Member countries, including oil refineries, powerplants over 20 megawatts (MW) in capacity, coke ovens, and iron and steel plants, along with cement, glass, lime, brick, ceramics, and pulp and paper installations. Covered entities emit about 45% of the EU's carbon dioxide emissions. The trading program covers neither CO₂ emissions from the transportation sector, which account for about 25% of the EU's total greenhouse gas emissions, nor emissions of non-CO₂ greenhouse gases, which account for about 20% of the EU's total greenhouse gas emissions. A "Phase 1" trading period ran from 2005 through 2007. A second, Phase 2, trading period began in 2008, covering the period of the Kyoto Protocol, with a third one planned for 2013. (For further background on the ETS, see CRS Report RL34150, *Climate Change: The EU's Emissions Trading System (ETS) Enters Kyoto Compliance Phase*, by Larry Parker. Relevant directives on the EU-ETS are available at [<http://ec.europa.eu/environment/climat/emission.htm#brochure>].)

This report examines the ETS and Title IV sulfur dioxide cap-and-trade program, with a focus on the market activity and the current regulatory overlay. From that discussion, observations are drawn about implications for regulating a future greenhouse gas trading scheme in the United States. No current U.S. cap-and-trade proposal has specific provisions with respect to carbon allowance financial instruments or who would regulate such a market or its participants.

⁴ For more on the EU-ETS, see CRS Report RL34150, *Climate Change: The EU Emissions Trading Scheme (ETS) Gets Ready for Kyoto*, by Larry Parker.

⁵ Maria Mansanet-Bataller, Angel Pardo, and Enric Valor, "CO₂ Prices, Energy and Weather," 28 *The Energy Journal* 3 (2007), pp. 73-92. Powernext (a French energy exchange) has described CO₂ prices as the cornerstone of relative energy prices for generating electricity. See Jean-Francois CONIL-LACOSTE, Chief Executive Officer, Powernext SA, *Market Based Mechanisms to Fight Climate Change* (2006).

⁶ See, e.g., Senate Permanent Subcommittee on Investigations, "Excessive Speculation in the Natural Gas Market" (Staff Report), June 2007, 135 p.

The European Emissions Trading System (ETS)

Background

The European Emissions Trading System (ETS) is by far the largest market for greenhouse gas emissions allowances. Trading began in 2005, when allowances were issued by the 27 member states of the European Union to about 12,000 electric utility and industrial sources of CO₂. In 2007, allowances for 1.6 billion metric tons of carbon emissions changed hands, with a financial value of nearly \$41 billion.⁷

Secondary market trading involves not only companies to whom allowances are originally allocated, but also a range of brokers and intermediaries. Trading occurs in the form of bilateral agreements and on over-the-counter (OTC) markets, both of which are essentially unregulated (other than an obligation to report all transactions to the national registry). Trading also takes place on financial exchanges, which are subject to various forms and degrees of regulation. The leading exchange market is the European Climate Exchange (ECX) in London, which handles about 75% of exchange-traded volume. The other exchanges with significant trading volumes are BlueNext (formerly Powernext), based in Paris, with about a 14% market share; Nord Pool, a Scandinavian electrical power exchange, which handles about 8%; and the European Energy Exchange (EEX), in Leipzig, Germany, with about 4% of volume.⁸

The basic unit of trading is the European Union Allowance (EUA), which permits the holder to emit one metric ton of CO₂. Allowances themselves are bought and sold in the spot market, but there are several additional forms of emissions trading:

- *Term contracts* call for a specified number of deliveries of allowances to take place over a period of time.
- *Forward contracts* are sales where delivery is to be made at a future date, but at today's price.
- *Futures contracts*, which are traded only on exchanges, give holders the right to buy or sell allowances over the term of the contract at the price that prevailed when the contract was made. They gain or lose value as the market price of the underlying allowance fluctuates, and they allow financial speculators who do not deal in physical CO₂ themselves to participate in the market.
- *Swaps* are economically equivalent to futures, but are traded over-the-counter rather than on an exchange. The value of a swap is linked to the price of the underlying allowance. The two

⁷ "Global Carbon Market Grows 80 Percent in 2007," *Business Wire*, January 18, 2008. (The source of the figures is Point Carbon, a brokerage firm.)

⁸ Kjetil Roine and Henrik Hasselknippe, "Emissions Trading in Europe," *Futures Industry*, May/June 2007. Figures are for 2006.

counterparties may structure the contract any way they like, but the essence is that one will pay the other if the price rises, and vice versa.⁹

- *Spreads* are two or more transactions that take place simultaneously. For instance, a firm with a surplus of 2008 EUAs that anticipates a shortage in 2009 might sell the former and buy the latter. The price would be expressed as the differential between the two contract prices at the time the trade was made.

In addition to the market in EUAs, there is a related market in certified emission reductions (CERs). A CER represents a reduction of CO₂ emissions by one ton outside the EU, generally in the developing world. CERs are created under the United Nations Kyoto Protocol. The United Nations, through its Clean Development Mechanism, verifies that the reductions have in fact taken place, and issues the corresponding CERs, which may be submitted by EU CO₂ emitters in place of EUAs within certain limits.¹⁰ To EU market participants, CERs and EUAs are close substitutes. Trading in CERs takes the same forms: regulated or unregulated spot markets and forwards, futures, and other derivative instruments.

What Is Regulated

Implementation of the ETS proceeded without a formal directive or specification as to secondary trading venues or regulation:

The legal framework of the ETS does not lay down how and where trading in allowances should take place. Companies and other participants in the market may trade directly with each other or buy and sell via a broker, exchange, or any type of market intermediary that may spring up to take advantage of a new market of significant size.¹¹

The decision was to let trading be shaped by market forces. As a result, the act of buying and selling allowances does not in itself subject one to regulation, or make one a regulated entity. This is not to say, however, that the EU envisioned a completely unregulated market. Instead, allowance traders come under regulation when they engage in financial practices that are regulated regardless of the nature of the underlying interest or instrument. Similarly, when transactions take place on

⁹ The EUA swap market has been slow to develop for two reasons. First, there is no standard contract documentation — several private trade associations have competing versions, which make it difficult for a trader with many individual contracts to calculate his overall position in the market. Second, there is no standard, universally accepted price source to use to calculate a swap's value. Several investment banks, brokers, and markets offer competing prices and indices.

¹⁰ In 2007, the secondary market in CERs amounted to 350 million metric tons, or \$8.3 billion. "Global Carbon Market Grows 80 Percent in 2007," *Business Wire*, January 18, 2008.

¹¹ European Commission, *EU Emissions Trading: An Open Scheme Promoting Global Innovation to Combat Climate Change*, Brussels, EU, 2005, p. 14.

regulated markets, emissions trading is regulated in the same way as other transactions executed on those markets. The degree of regulation depends on two things: (1) does the instrument being traded meet the definition of a financial instrument or product, and (2) is the trade taking place on a regulated market? Although financial regulation has been harmonized in the EU to a significant degree, there remains some variation in these definitions and in market regulation among EU member states.

On the first key point — what is being traded — there appears to be general agreement among national laws. The simple sale of an allowance by one party to another does not subject either party to regulation.¹² A firm may sell its EUAs the way it sells any other piece of property.

If, however, what is being transferred is not an EUA itself, but rather a financial contract that conveys rights to an EUA, or that is based on future delivery or the future price of an allowance, the trade meets the definition of a financial transaction or instrument in many countries and may be regulated. A person arranging or participating in such a transaction may come under the jurisdiction of banking or securities laws and be required to register as an intermediary or broker.¹³ Certain forms of trades, like futures contracts, may be restricted to regulated futures exchanges.

Trades that are otherwise unregulated may come under government oversight if they occur on a regulated market. Several of the European emissions exchanges provide a platform for spot market trades, as well as financial contracts. These spot trades are subject to the same types of market surveillance as the financial contracts (some of which could not be legally executed off-exchange), and the same registration and reporting requirements apply. In addition, if an unregulated over-the-counter (OTC) trade, such as a swap or forward contract, is processed and guaranteed by a regulated clearing house, that trade is also open to the scrutiny of financial regulators.¹⁴

¹² The exception, as always, is that trades must be reported to the national registries, which are linked electronically to a central EU facility. An ownership registry is necessary because all firms must surrender at the end of each year a quantity of allowances sufficient to cover their emissions (or else pay cash to cover the excess pollution).

¹³ The website of the International Emissions Trading Association (IETA) has brief summaries of Polish, German, Dutch, and Czech laws on this point. See [<http://www.ieta.org/ieta/www/pages/index.php?IdSitePage=152>], visited February 27, 2008.

¹⁴ A derivatives clearing house guarantees that all contracts will be paid, even if an individual counterparty defaults. Clearing houses are a traditional feature of the futures exchanges: the guarantees they provide permit rapid trading to occur by eliminating the need for traders to assess the opposite party's creditworthiness. In recent years, clearing houses have begun to accept off-exchange, or over-the-counter (OTC), trades as well. LCH.Clearnet, a British clearing house, announced that it would provide clearing services for OTC emissions trades beginning on February 29, 2008. See LCH.Clearnet, Press Release, February 25, 2008.

How Exchanges Are Regulated

National regulations vary within the EU. The differences, however, continue to diminish as a result of both EU harmonization directives and the globalization of markets, which is most visible in the numerous cross-border mergers that continue to occur among securities and futures exchanges. Many of the differences that remain are matters of terminology rather than substance.

In general, the exchanges where emissions and emissions derivatives are traded are subject to a regulatory scheme broadly comparable to the regulation of the futures exchanges in the United States by the Commodity Futures Trading Commission (CFTC).¹⁵ The exchange itself must satisfy numerous conditions of registration, which include market surveillance to deter fraud and manipulation, various reporting requirements including publication of trade and price data, and so on. Exchange rules are generally subject to regulatory oversight or approval.

Access to the trading mechanisms is generally limited to exchange members; others must trade as customers of a member intermediary. Exchange members may be required to register with a regulatory agency and in all cases are subject to exchange rules and financial standards. (Apart from their exchange memberships, brokerage firms may also be subject to registration and regulation by financial authorities because of the nature of their business.) Some features of the regulatory environments of the four largest EU emissions exchanges are set out in an appendix to this report.

Clearing houses may be part of an exchange or stand-alone entities. They are also subject to registration requirements, generally administered by the exchange regulator. In addition, because they represent a concentration of financial risk, they may be subject to central bank safety and soundness regulation.

The fact that a given market organization may be international in scope may require it to report to multiple national regulators.¹⁶ This does not appear to have been a barrier to the development of the market, or a source of market fragmentation. As noted above, London has become the trading center, with about three-quarters of all secondary derivatives trading. (In commodity markets, trading tends to gravitate to the single market providing most liquidity. Before the EU drive for a single financial market, this impulse was blocked by laws and regulations in several European countries intended to preserve a monopoly for local exchange and traders.)

¹⁵ CFTC regulation, in many aspects, is modeled on Securities and Exchange Commission (SEC) regulation of the stock markets.

¹⁶ For example, due to local legal provisions, LCH.Clearnet SA reports to French, Dutch, Belgium and Portuguese regulators as follows: Banque de France, Autorité des Marchés Financiers, Comité des Etablissements de Crédit et des Entreprises d'Investissement, Commission Bancaire; Commission Bancaire, Financière et des Assurances, Banque Nationale de Belgique ; and De Nederlandsche Bank, Autoriteit Financiële Markten. [http://www.lchclearnet.com/rules_and_regulations/sa/], visited February 26, 2008.

Lessons from the ETS

The fact that the ETS was implemented without a formal, government-devised blueprint for secondary trading does not appear to have caused significant problems in the market. According to one study, “This apparent confidence in market ingenuity has proved well-founded.”¹⁷ Trading volumes are growing rapidly, suggesting that investors do not view the market as being rigged against them or subject to manipulation by insiders.

This does not mean that the first phase of the ETS (from 2005 through 2007) was an unqualified success. In fact, many regard it as a disaster. The major problem, however, did not come from the secondary market but rather from the primary market process of allocating and issuing EUAs.

When phase one began in 2005, trading commenced before the formal allocations had been made. Thus, prices were initially based on traders’ expectations of the number of EUAs that would be issued.¹⁸ Allocations were not made at the EU level, but were left to the discretion of individual countries. When the allocations were finally made, it became apparent that some countries had been very generous and that the total supply of EUAs was going to be much higher than the market anticipated. As a result, the market crashed in the spring of 2006: the price per EUA dropped in a few weeks from over €31 to less than €11 (and by the end of phase one, in 2007, fell below one euro).¹⁹

The price crash, by weakening the financial incentive to reduce pollution, undermined the basic rationale for the ETS. Although the problem did not originate in the secondary market, it did raise questions about the adequacy of market regulation. In particular, many observers suspect that information about the size of allocations leaked before official publication, and that certain traders profited from this knowledge. Traders with nonpublic information on certified emissions data — which gives an indication of future demand for allowances — may also have profited:

Unauthorized leaks of verified emission data for 2005 in several countries created information asymmetries and undue opportunities for some businesses market participants. This has highlighted the need for strict rules and procedures for handling of price-sensitive information along the lines that is common in more mature financial markets.²⁰

¹⁷ Liz Bossley, *Emissions Trading and the City of London*, London, City of London, 2006, p. 31.

¹⁸ Additionally, trading in EUAs began before the national registries were operational. As a result, all early trades were forward contracts, because immediate delivery was impossible.

¹⁹ Alex Scott, “Europe’s CO2 Permit Prices Dive; Further Turbulence is Expected,” *Chemical Week*, vol. 168, May 17, 2006, p. 15.

²⁰ Statement of Per-Otto Wold, in U.S. Congress. Senate. Committee on Energy and Natural Resources, *EU Emissions*, Hearing, 110th Cong., 1st sess., March 26, 2007, p. 11.

A number of theoretical studies have raised the possibility of price manipulation by a dominant firm or by a few large firms acting in collusion — while thousands of pollution sources receive EUAs, a few large power generators account for a disproportionate share.²¹ Some observers have raised the possibility that such manipulation may have occurred during the price crash:

The fact that knowledge about excess allowances has gradually become known without the market reacting immediately was seen by some analysts as a sign that there might have been collusion of the big power companies, which in essence are the major buyers and equally benefit by a high allowance price through higher power prices.²²

It is likely, however, that any undue market power accruing to a few large consumers of allowances — in the EU or the United States — will diminish as emissions trading becomes global in scope, particularly if markets are linked electronically.

It should be noted that EU regulators have not brought any enforcement actions based on manipulation of emissions prices (in public, at least). On balance, the secondary market in emissions allowances that has evolved without central direction, and in a combination of regulated and unregulated venues, appears to have functioned well. For the most part, the incentives of market participants and regulators are in alignment: both want an efficient and transparent price discovery mechanism, and a financially-sound market free of manipulation and fraud.

The U.S. Sulfur Dioxide Trading Program (Title IV)

Background

Title IV of the 1990 Clean Air Act Amendments supplements the sulfur dioxide (SO₂) command-and-control system of the Clean Air Act (CAA) by limiting total SO₂ emissions from electric generating facilities to 8.95 million tons annually, beginning

²¹ See, e.g., Robert Godby, “Market Power in Laboratory Emission Permit Markets,” *Environmental and Resource Economics*, vol. 23, November 2002, p. 279; Akira Maeda, “The Emergence of Market Power in Emission Rights Markets: The Role of Initial Permit Distribution,” *Journal of Regulatory Economics*, vol. 24, November 2003, p. 293; and Matti Liski and Juan-Pablo Montero, “A Note on Market Power in an Emission Permits Market with Banking,” *Environmental and Resource Economics*, vol. 31, June 2005, p. 159.

²² Christian Egenhofer, “The Making of the EU Emissions Trading Scheme,” *European Management Journal*, vol. 25, December 2007, p. 455. This scenario is the opposite of what was suggested above: instead of trading ahead of the publication of price-sensitive information, the putative manipulators *fail to trade* on such information, maintaining an artificially high price. In another hypothetical scenario, large traders with inside information could prop up the price in the spot market to give them time to take short positions in the derivatives market that would become profitable when the spot price eventually fell.

in the year 2000.²³ Title IV essentially caps SO₂ emissions at individual utility sources operating before enactment of the CAA in 1990 (known as “existing sources”) through a tonnage limitation, and at those plants beginning operation after enactment (known as “new sources”) through an emissions offset requirement. SO₂ emissions from most existing sources are capped at a specified emission rate times a historical average fuel consumption level. Beginning January 1, 2000, SO₂ emissions from new plants commencing operation after enactment must be offset — in effect, the emissions cap for new sources is zero. Their allowances come from emissions reductions at existing facilities. The program was implemented through a two-phase process with the final phase beginning in 2000.

To implement the SO₂ reduction program, the law creates a comprehensive permit and emissions allowance system (cap-and-trade program). An allowance is a limited authorization to emit a ton of SO₂ during or after a specified year. Issued by EPA, the allowances are allocated to existing power plant units in accordance with formulas delineated in the law. The owner of the facility receives the allowances for a given plant regardless of the actual operation of the plant. For example, an owner may choose to shut down an existing power plant and use those allowances to offset emissions from two newer, cleaner facilities. As noted, generally, a power plant that commences operation after enactment receives no allowances, requiring new units to obtain allowances from those with allowances, or purchase them at an EPA-sponsored auction, in order to operate after 2000. An owner may trade allowances nationally as well as bank allowances for future use or sale.

If an affected unit does not have sufficient allowances to cover its emissions for a given year, it is subject to an emission penalty of \$2,000 (1990\$, indexed to inflation) per ton of excess SO₂, and it submits to EPA a plan for offsetting those excess emissions in the next year (or longer if EPA approves). Further, EPA must deduct allowances equal to the excess tonnage from the source’s allocation for the next year.

Another EPA responsibility is to provide for allowance auctions. For the post-2000 period, the law sets aside a percentage of available allowances for auction. Anyone may participate in these auctions as a buyer or seller, and those selling allowances may specify a minimum sale price. EPA may delegate or contract the conduct of the auctions to other agencies, such as to the Department of the Treasury, or even to nongovernmental groups or organizations. Two streams of allowances are sold in the auctions. The first stream represents “spot sales” of allowances that must either be used in the year they are sold or banked for use in a later year. The second stream represents “advance sales” of allowances that must either be used in the seventh year after the year they are first offered for sale or be banked for use in a later year. For 2000 and thereafter, Title IV provides that 125,000 allowances be set-aside annually for spot sales, and 125,000 for advance sales.

²³ Clean Air Act Amendments of 1999, P.L. 101-549, Title IV. For a more detail discussion of the title, see Larry B. Parker, Robert D. Poling, and John L. Moore, “Clean Air Act Allowance Trading,” 21 *Environmental Law* 2021-2068 (1991).

Administering the Program: The Environmental Protection Agency (EPA)

It is EPA's responsibility to administer the trading, banking, and auctioning of allowances.

Allowance Accounting. EPA has developed an integrated system to track allowances (the Allowance Tracking System — ATS)²⁴; to verify and record SO₂ emissions from affected units (the Emission Tracking System — ETS); and to reconcile (true-up) allowances and emissions at the end of the year. The Allowance Tracking System is the official record of allowance transfers and balances used for compliance purposes. Each participant in the system has an ATS account, and each account has an identification number.

Table 1 identifies what the ATS tracks and does not track with respect to allowance activity. As suggested, EPA primarily gathers information to ensure compliance with the emission limitations of Title IV — the ATS is not a trading platform. Participants are not required to record all transfers with EPA until the affected allowances are to be used for compliance. Participants must notify EPA to have any transfers recorded in the ATS. When parties agree on a transaction that they want recorded on the ATS, they provide information on the buyer and seller and the serial numbers of the affected allowances to the ATS which records the transfer.

Table 1. Information Recorded by EPA's Allowance Tracking System

ATS Records	ATS Does Not Record
Allowances issued	Allowance prices
Allowances held in each account	Option trades
Allowances held in various EPA reserves	Any allowance transaction not officially reported to EPA
Allowances surrendered for compliance purposes	
Allowances transferred between accounts	

To facilitate its primary compliance responsibility, EPA assigns each allowance allocated a unique 12-digit serial number that incorporates the first year it can be used for compliance purposes. These allowances may be held in one of two types of ATS accounts. First, there are Unit Accounts where allowances provided under Title IV allocation formulas are deposited and where allowances are removed by EPA for compliance purposes. Second, there are General Accounts that may be created by

²⁴ EPA has renamed the ATS the Allowance Management System (AMS), but ATS remains the commonly used term and will be used in this report.

EPA for anyone wishing to hold, trade, or retire allowances. Participating entities with General Accounts include (1) utilities who keep a pooled reserve of allowances not needed immediately for compliance (i.e., an allowance bank); (2) brokers who need a holding account for allowances in the process of being bought or sold; (3) investors holding allowances for future sale; and (4) environmental and other groups holding allowances they wish to remove from the market (i.e., retire).

Allowance Auctions. A key provision of Title IV to ensure liquidity in the SO₂ markets for new entrants is the EPA allowance auction. As noted above, the EPA is required to auction 250,000 allowances annually in two streams, spot and advance. The auctions began in 1993 and are held annually — usually on the last Monday in March. Sealed bids entailing the number, type, and price, along with payment, are sent to EPA no later than three business days before the auctions.

The auctions sell the allowances according to bid price, starting with the highest bid and continuing down until all allowances are sold or there are no more bids. Unlike allowances offered by private holders for auction, these EPA allowances do not have a minimum price.

For the first 13 years, the auctions were conducted by the Chicago Board of Trade (CBOT) for EPA. CBOT received no compensation for the service, nor was it allowed to charge fees. Beginning in March 2006, CBOT decided to stop administering the auctions; EPA now conducts them directly.

Interface with Electricity Regulation: The Federal Energy Regulatory Commission (FERC) and State Public Utility Commissions (PUCs)

Background. The 1990 Clean Air Act Amendments were enacted during a time of transition in the electric utility industry. There are three components to electric power delivery: generation, transmission, and distribution. Historically, electricity service was defined as a natural monopoly, meaning that the industry had (1) an inherent tendency toward declining long-term costs, (2) high threshold investment, and (3) technological conditions that limited the number of potential entrants. In addition, many regulators considered unified control of generation, transmission, and distribution the most efficient means of providing service. As a result, most people (about 75%) were served by vertically integrated, investor-owned utilities.

The Public Utility Holding Company Act (PUHCA)²⁵ and the Federal Power Act (FPA) of 1935 (Title I and Title II of the Public Utility Act)²⁶ established a regime for regulating electric utilities that gave specific and separate powers to the states and the federal government. Essentially, a regulatory bargain was made between the government and utilities. Under this bargain, utilities must provide electricity to all users at reasonable, regulated rates in exchange for an exclusive

²⁵ 15 U.S.C. 79 et seq.

²⁶ 16 U.S.C. 791 et seq.

franchise service territory. State regulatory commissions address intrastate utility activities, including wholesale and retail rate-making. Authorities of these commissions tend to be as broad and varied as the states are diverse. At the least, a state public utility commission will have authority over retail rates, and often over investment and debt. At the other end of the spectrum, the state regulatory body will oversee many facets of utility operation. Despite this diversity, the essential mission of the PUC is the establishment of retail electric prices. This is accomplished through an adversarial hearing process complete with attorneys, briefs, witnesses, etc. The central issues in such cases are the total amount of money the utility will be permitted to collect (revenue requirement) and how the burden of the revenue requirement will be distributed among the various customer classes (rate structure).²⁷ This is commonly known as “rate of return” (ROR) regulation.

Under the regime set up by the Federal Power Act (FPA), federal economic regulation addresses wholesale transactions and rates for electric power flowing in interstate commerce. Historically, federal regulation followed state regulation and is premised on the need to fill the regulatory vacuum resulting from the constitutional inability of states to regulate interstate commerce. In this bifurcation of regulatory jurisdiction, federal regulation is limited and conceived to supplement state regulation. The Federal Energy Regulatory Commission (FERC) has the principal functions at the federal level for the economic regulation of the electricity utility industry, including financial transactions, wholesale rate regulation, transactions involving transmission of unbundled retail electricity, interconnection and wheeling of wholesale electricity, and ensuring adequate and reliable service. In addition, until passage of the 2005 Energy Policy Act (EPACT05),²⁸ the Securities and Exchange Commission (SEC) regulated utilities’ corporate structure and business ventures under PUHCA to prevent a recurrence of the abusive practices of the 1920s (e.g., cross-subsidization, self-dealing, pyramiding, etc.).

This comprehensive, cost-based approach to regulation began to undergo change in the 1970s and 1980s as passage of the Public Utility Regulatory Policies Act of 1978 (PURPA)²⁹ and the Fuel Use Act of 1978 (FUA)³⁰ helped establish independent electricity generators — electricity producers who sold at wholesale and had no exclusive franchise area. Building on the perceived success of these independent generators under PURPA, the Energy Policy Act of 1992 (EPACT92) created a new category of wholesale electric generators called Exempt Wholesale Generators (EWGs) that are not considered utilities and not regulated under PUHCA.³¹ EWGs, also referred to as *merchant generators*, were intended to create

²⁷ For a comprehensive discussion of state and federal regulation, see Robert Poling, et. al., *Electricity: A New Regulatory Order?* Report for the Committee on Energy and Commerce, House of Representative (June 1991), committee print.

²⁸ P.L. 109-58.

²⁹ P.L. 95-617, 16 U.S.C. 2601.

³⁰ P.L. 95-620.

³¹ Exempt Wholesale Generators may sell electricity only at wholesale. EWGs may be located anywhere, including foreign countries. Before enactment of EPACT05, utility
(continued...)

a competitive wholesale electric generation sector. EPACT92 effectively initiated deregulated wholesale generation by creating a class of generators that were able to locate beyond a typical service territory with open access to the existing transmission system. EPACT05 continued this process by adding provisions to address system reliability, repeal PUHCA, and modify PURPA.³²

The current status of these initiatives and resulting state responses is a mixture of states with traditional, comprehensive ROR regulation of electricity and those with a restructured industry with segmented generation, transmission, and distribution components. Over the past 20 years, some States have truncated their ROR regulation to the extent they have chosen to restructure their industry in response to Federal initiatives. In states that have not restructured, the system operates as it has since enactment of the Federal Power Act, with retail consumers paying one price that includes transmission, distribution, and generation. This is referred to as a *bundled transaction*. In states that have restructured, consumers are billed for separate transmission, distribution, and generation charges. This is referred to as *unbundled electricity service*. In those states, retail consumers are allowed to choose their retail generation supplier; however, few states actually have competitive markets for retail choice (exceptions include Texas and Massachusetts). FERC regulates all transmission, including unbundled retail transactions.³³

FERC Allowance Accounting. With the restructuring of the electric utility industry, FERC generally does not set cost-based rates for electricity generation under its jurisdiction. Rather, FERC conducts a two-pronged horizontal and vertical

³¹ (...continued)

generators were limited by the Public Utility Holding Company Act of 1935 (PUHCA) to operate within one state.

³² In repealing PUHCA, EPACT05 provides that FERC and state regulatory bodies must be given access to utility books and records. Also, FERC is given approval authority over the acquisition of securities and the merger, sale, lease, or disposition of facilities under FERC's jurisdiction with a value in excess of \$10 million. With respect to PURPA, EPACT05 repeals the PURPA mandatory purchase requirement for new contracts if FERC finds that a competitive electricity market exists and a qualifying facility has adequate access to wholesale markets. Among its provisions to address reliability, FERC is authorized to certify a national electric reliability organization (ERO) to enforce mandatory reliability standards for the bulk power system. For more information on EPACT05, see CRS Report RL33248, *Energy Policy Act of 2005, P.L. 109-58, Electricity Provisions*, by Amy Abel.

³³ On October 3, 2001, the U.S. Supreme Court heard arguments in a case (*New York et al. v. Federal Energy Regulatory Commission*) that challenged FERC's authority to regulate transmission for retail sales if a utility unbundles transmission from other retail charges. In states that have opened their generation market to competition, unbundling occurs when customers are charged separately for generation, transmission, and distribution. Nine states, led by New York, filed suit, arguing that the Federal Power Act gives FERC jurisdiction over wholesale sales and interstate transmission and leaves all retail issues up to the state utility commissions. Enron in an amicus brief argued that FERC clearly has jurisdiction over all transmission and FERC is obligated to prevent transmission owners from discriminating against those wishing to use the transmission lines. On March 4, 2002, the U.S. Supreme Court ruled in favor of FERC and held that FERC has jurisdiction over transmission, including unbundled retail transactions.

market power analysis to determine an entity's eligibility for "market-based" wholesale rates.³⁴ If eligible, the entity may set its wholesale prices according to market demand, not according to production costs.

Because of the market-based nature of FERC wholesale rates, allowances are an accounting issue, not a ratemaking issue for FERC. Electric public utilities and licensees within FERC jurisdiction are required to maintain their books and records in accordance with FERC's Uniform System of Accounts (USofA).³⁵ The USofA guides the jurisdictional entity in understanding the information it needs to report on various FERC forms. Included in the USofA are instructions on how to account for allowances allocated to the entity under the 1990 Clean Air Act, or acquired by the entity for speculative purposes. Allowances owned for other than speculative purposes are accounted for at cost in either Account 158.1 (Allowance Inventory), or Account 158.2 (Allowances Withheld) as appropriate. Allowances acquired for speculative purposes are accounted for in Account 124 (Other Investments).³⁶

By defining allowance value in terms of historic costs, allowances allocated by EPA to entities are valued at zero. FERC does require that the records supporting Account 158.1 and 158.2 be maintained "in sufficient detail so as to provide the number of allowances and the related cost by vintage year." Likewise, the Uniform System of Accounts also provides instruction on accounting for gains and losses from selling allowances.

It should be noted that the Internal Revenue Service (IRS) also values allowances allocated by EPA to an entity on a zero-cost basis.³⁷

State Public Utility Commissions. In states with bundled rates, the valuing and disposition of allowances is more than an accounting issue, it is also a ratemaking issue. During and after passage of Title IV, there was substantial debate and studies were done on the role of the PUCs in facilitating (or hindering) allowance trading.³⁸ In Title IV, the regulatory treatment of allowances is left to the appropriate state and federal regulatory bodies. Title IV contains no mandated requirements regarding the treatment of allowance transactions in state utility rate proceedings.

³⁴ FERC Order 697, *Market-Based Rates for Wholesale Sales of Electric Energy, Capacity and Ancillary Services by Public Utilities*, Docket No. RM04-7-000, Final Rule (issued June 21, 2007).

³⁵ Code of Federal Regulations, Title 18, *Conservation of Power and Water Resources*, Part 101.

³⁶ Code of Federal Regulations, Title 18, *Conservation of Power and Water Resources*, Part 101. Allowance accounting is described under *General Instructions Number 21*.

³⁷ Treatment of emission allowances under the Federal income tax is spelled out in Rev. Rul. 92-16, *Internal Revenue bulletin*, No. 1992-12, March 23, 1992, p. 5 and Rev. Proc. 92-91, *Internal Revenue Bulletin*, No. 1992-46, November 16, 1992-13, p. 32-33. See also, Announcement 92-50, *Internal Revenue bulletin*, No. 1992-12, March 30, 1992, p. 32.

³⁸ For example, see Kenneth Rose, et. al., *Public Utility Implementation of The Clean Air Act's Allowance Trading Program*, National Regulatory Research Institute, May 1992.

Basically, Congress chose to leave the state commissions free to apply any rate treatment they deem reasonable and appropriate.

The states responded in a diverse manner, some states issuing broad guidelines on treatment of allowance transactions while others decided such events on a case-by-case basis. An analysis of the interaction between PUCs and the allowance system made three general observations about the resulting PUC treatment of allowances: (1) regulations tend to require 100% of both expenses and revenues from allowances to be returned to ratepayers with net gains (losses) incurred used to offset (or increase) fuel costs; (2) a few states have allowed utilities to retain some of the profits as an incentive to sell excess allowances; (3) state regulations tend to be tailored to a state's specific circumstance — “allowance rich” states have regulations encouraging sales, “allowance poor” states have regulations encouraging purchases.³⁹ The focus of PUC decisions has not been to encourage allowance transactions, but generally to ensure ratepayers and not shareholders receive the benefits of the allowances. In some cases, PUCs have also used their authority to encourage utilities to protect high-sulfur coal production, even if it is not the most cost-effective control strategy.⁴⁰

Allowance Transactions

Internal Transfers. When the 1990 Clean Air Act Amendments were enacted, about 75% of the allowances were allocated to vertically integrated, ROR regulated entities. Today, that percentage has shifted with more allowances allocated to independent generating entities as some utilities have divested themselves of their generating assets. This diversification of ownership is reflected to some degree in the ATS statistics on official transfers and transactions.⁴¹ As indicated by **Table 2**, in the first two years of trading, transfers between economically unrelated entities were a small percentage of total transfers. More recent data suggest that transfers between unrelated entities account for about 50% of total transfers. However, it is clear that internal transfers remain a major part of the allowance market, even in a restructured industry, and that the total number of official transactions occurring is quite modest.

Internal transfers (i.e., transfers within or between economically related entities) tend to be transacted in accordance with agreements that the utility and/or holding company has filed with the appropriate state PUC, or FERC, or both.⁴²

³⁹ Elizabeth M Bailey, *Allowance Trading Activity and State Regulatory Rulings: Evidence from the U.S. Acid Rain Program*, MIT, March 1998, pp. 9-10.

⁴⁰ See Ken-Ichi Mizobuchi, *The Movements of PUC Regulation Effects in the SO₂ Emission Allowance Market*, Kobe University, May 2004.

⁴¹ “Official” here means that the transfer has been recorded by the ATS. The actual transfer of ownership may have occurred earlier. As noted earlier, parties are not required to notify the ATS of any transfer within a specific time period and may choose for some reason to delay informing the ATS of a transfer.

⁴² For example, see the now terminated agreement AEP System Interim Allowance Agreement filed with the FERC on August 30, 1996 in Docket No ER96-2213-000

(continued...)

Table 2. EPA Official Allowance Transfers and Transactions: 1994-2003

Year	Total Transfers (millions of allowances)	Transfers between economically distinct organizations (millions of allowances)	Percent of Total Transfers	Total Number of Transactions	Transactions between economically distinct organizations	Percent of Total Transactions
1994	9.2	0.9	9.8%	215	66	30.7%
1995	16.7	1.9	11.4%	613	329	53.7%
1996	8.2	4.4	53.7%	1,074	578	53.8%
1997	15.2	7.9	52.0%	1,429	810	56.7%
1998	13.5	9.5	70.4%	1,584	942	59.5%
1999	18.7	6.2	33.2%	2,832	1,743	61.5%
2000	25.0	12.7	50.1%	4,690	2,889	61.6%
2001	22.5	12.6	56.0%	4,900	2,330	47.6%
2002	21.4	11.6	54.2%	5,755	2,841	49.4%
2003	16.5	8.1	49.1%	4,198	1,544	36.8%
2004	15.3	7.5	49.0%	20,000	n/a	n/a
2005	19.9	10.0	50.3%	5,700	n/a	n/a

Source: U.S. Environmental Protection Agency, 2007.

Over the Counter: Cash Market, Futures and Options. Beyond restructuring, other entities are emerging as participants in the allowance markets. This increased diversity of interest in the allowance market is reflected in the most recent (2007) EPA allowance auction. As indicated by **Table 3**, several brokerages have created positions in the allowance market, both for themselves and their clients. This may suggest an increasing importance of intermediaries to the functioning of the allowance market, the development of a more liquid market, and to the maturing of that market.

⁴² (...continued)

designated as Appalachian Power Company Supplement No. 9 to Rate Schedule FPC No. 20; Columbus Southern Power Company Supplement No. 3 to Rate Schedule FPC No. 30; Indiana Michigan Power Company Supplement No. 10 to Rate Schedule FPC No. 17; Kentucky Power Company Supplement No. 6 to Rate Schedule FPC No. 11; and, Ohio Power Company Supplement No. 9 to Rate Schedule FPC No. 23. Agreement terminated by FERC, effective January 1, 2002, in accordance with the mutual consent of the parties thereto.

Table 3. EPA 2007 Auction Results
(Winners of more than 20 allowances)

Spot Market Bid Winners	Quantity	Percent of Total Allowances offered (125,000)
Morgan Stanley	50,000	40.00%
KS&T, LP	30,575	24.46%
Saracen Energy LP	15,000	12.00%
Transalta Energy Marketing U.S.	9,900	7.92%
South Carolina Public Service Authority	7,500	6.00%
Alpha	5,000	4.00%
Constellation Energy Commodities Group, Inc.	2,500	2.00%
Merrill Lynch Commodities Inc.	2,500	2.00%
The Detroit Edison Company	2,000	1.60%
TOTAL SPOT	124,975	99.98%
7 Year Advance Bid Winners	Quantity	Percent of Total Allowances offered (125,000)
American Electric Power	80,000	64.00%
DTE	30,000	24.00%
Cantor Fitzgerald Brokerage	10,000	8.00%
Bear Energy	4,986	3.99%
TOTAL ADVANCE	124,986	99.98%

Source: Environmental Protection Agency, 2007

The basic market for allowance trading is the Over-The-Counter (OTC) market. The most common trading structure involves spot sales with immediate settlement accounting and delivery into EPA's Allowance Tracking System (ATS) with payment by wire transfer in three business days.⁴³ Daily spot trading volumes for immediate settlement are estimated in the 10,000 to 25,000 ton range.⁴⁴ Forward

⁴³ Peter Zaborowsky, *The Trailblazers of Emissions Trading*, Evolution Markets Inc. (April 23, 2002).

⁴⁴ Ibid. In September 2007, the monthly volume was estimated at 175,000-200,000 by Evolution Markets Inc., who termed it low volume. Evolution Markets Inc., *SO₂ Markets* (continued...)

settlement transactions are less common and are fairly short-dated — 6 to 18 months out. Vintage swaps also occur in both markets with the difference in value usually paid in additional allowances rather than cash.⁴⁵ This preference for allowances reflects regulated entities' desire to keep these transactions non-taxable under current IRS regulations. Cash market transactions are facilitated in some cases through available electronic trading platforms, such as Intercontinental Exchange, Inc. (ICE) and TradeSpark (CantorCO2e), and by the emergence of a number of allowance brokers. Currently, EPA lists 14 allowance brokers on its website.⁴⁶ A similar list is available from the Environmental Markets Association — a trade association.⁴⁷ Brokers tend to be registered with the SEC and one or more Self-Regulatory Organizations, such as FINRA; but participation in this market would not in itself make a firm subject to SEC regulation. Four brokers — Cantor Fitzgerald, Evolution, ICAP Energy, and TFS Energy — form the basis of the *Platts* emission price index. *Argus AIR Daily* also produces price indices through daily phone surveys of active brokers.

Two exchanges provide SO₂ future contracts as well as clearing services: New York Mercantile Exchange (NYMEX) and Chicago Climate Futures Exchange (CCFE). The availability of exchanges as a trading platform for allowances or to clear transactions was cheered by traders when established in late 2004 and 2005. As stated by the Environmental Markets Association with respect to NYMEX's decision: "NYMEX does offer information on power, and any time you have them expanding into our market, that's going to create opportunities for people who may be using other products to take a second look at emissions."⁴⁸ Both exchanges offer standardized and cleared futures contracts, along with clearing services for off-exchange transactions. As reported by *Platts*, futures volume on both exchanges have expanded greatly over the past year. SO₂ futures trading on the CCFE was nearly 1.9 million allowances in the first half of 2007, compared with about 500,000 during the same time in 2006. For the NYMEX, volumes in the first half of 2007 was 665,000 allowances — a more than three-fold increase over the first half of 2006.⁴⁹ **Table 4** summarizes the basic features of the trading instruments.

⁴⁴ (...continued)

— *September 2007* at [http://www.evomarkets.com/assets/mmu/mmu_so2_sep_07.pdf].

⁴⁵ The first year an allowance may be used for compliance is called its "vintage." This situation can result in entities engaging in a "vintage swap." For example, a "vintage swap" may occur because one entity has excess allowances in the upcoming year (2008) but anticipates it will have insufficient allowances in 2009. Another entity may be in the opposite position because of planning future emission reductions. The two entities agree to "swap" allowances to improve their allowance streams over these years.

⁴⁶ EPA Website: [<http://www.epa.gov/airmarkets/trading/buying.html>].

⁴⁷ EMA Website: [<http://www.environmentalmarkets.org/page.wv?section=About+Us&name=Company+Directory>].

⁴⁸ Comment of Matt Most, Emissions Market Association, as reported in *Platts Emissions Daily*, "Emissions market hails NYMEX move," February 15, 2005, p. 1.

⁴⁹ *Platts Emissions Daily*, "Emissions exchanges continue to grow SO₂, NO_x futures markets," August 10, 2007, p. 1.

Table 4. SO₂ Futures Contract Specifications

	NYMEX	CCFE
Trading Platform	ClearPort	ICE
Clearing Organization	NYMEX ClearPort Clearing	The Clearing Corporation (CCorp)
Self Regulatory Organization	NYMEX and National Futures Association (NFA)	National Futures Association (NFA)
CFTC Regulatory Status	Designated Contract Market	Designated Contract Market
Contract size	100 SO ₂ allowances	25 SO ₂ allowances
Minimum Price Fluctuation	\$25 per contract	\$2.50 per contract
Settlement	Physical through EPA's ATS	Physical through EPA's ATS
Symbol	RS	SFI

Source: NYMEX and CCFE.

In April, 2007, the CCFE began offering SO₂ options.⁵⁰ For October 2007, the CCFE offered European-style options⁵¹ on its futures contracts for expiration on the October 2007, November 2007, December 2007, April 2008, and December 2008 futures contracts.⁵² As with the futures market, participants are required to settle their delivery obligations via the ATS. Volume remains light with the CCFE reporting in July, 2007 that there were 200 calls on July contracts, 5,315 calls and 411 puts on August 2007 contracts, 740 calls and 46 puts on September 2007 contracts, and 440 calls on the December 2007 contracts.⁵³ The spike in calls and puts in the August 2007 contracts in July may reflect a peak in allowance prices that occurred in July 2007 and future uncertainty about allowance price direction over the summer.⁵⁴ The NYMEX does not offer SO₂ options.

⁵⁰ Chicago Climate Futures Exchange, *Chicago Climate Futures Exchange to Launch Options market on Sulfur Financial Instrument Futures Contracts*, Chicago, April 5, 2007.

⁵¹ An option that can only be exercised for a short, specified period of time just prior to its expiration, usually a single day. "American" options, however, may be exercised at any time before expiration.

⁵² For current options market data, see [http://www.ccfex.com/mktdata_ccfe/sfi_options.jsf].

⁵³ CCFE Market Report, *CCFE SFI Options*, (July 2007), p. 3, table 4.

⁵⁴ Traditional Financial Services (a brokerage firm) noted the peak in allowance prices in July because of higher than expected storage in the natural gas markets. See TFS, *Global Environmental Markets*, August 2007, available at [<http://www.tfsbrokers.com/pdf/global-reports/2007/tfs-ger-08-07.pdf>].

Regulation of Allowances as an Exempt Commodity: Commodity Futures Trading Commission (CFTC)

Definition. The Commodity Exchange Act provides the basis for federal regulation of “derivative” transactions in contracts based on commodity prices. Pursuant to the act, the Commodity Futures Trading Commission (CFTC) regulates the futures exchanges, such as NYMEX, and certain other derivative transactions that occur off-exchange. The CFTC’s authority varies according to the identities of the market participants and the nature of the underlying commodity. In general, the CFTC does not regulate spot (or cash) trades in commodities, or forward contracts that will be settled by delivery of the physical commodity (which are also considered cash sales).⁵⁵

In terms of allowances, the CFTC’s jurisdiction is confined to trades that take place on those markets it regulates. It has no jurisdiction over spot trades in allowances, full jurisdiction over futures and options trades on regulated exchanges, and limited jurisdiction over derivatives trades on certain other markets subject to lighter regulation than the exchanges.

Allowances are regulated by the CFTC as exempt commodities under the Commodity Futures Modernization Act of 2000.⁵⁶ The Commodity Exchange Act defines an exempt commodity as any commodity other than an excluded commodity (e.g., financial indices, etc.) or an agricultural commodity. Examples include energy commodities and metals. Emission allowances are related to energy production. This designation has been supported by other federal entities. In a 2005 Interpretive Letter approving physically settled emission derivatives transactions, the Office of the Comptroller of the Currency, Administrator of National Banks, states that physical settlement of emission allowances do not pose the same risk as other physical commodities:

The proposed emissions derivatives transactions [e.g., futures, forwards, options, swaps, caps, and floors] will be linked to three emission allowance markets: the U.S. SO₂ (Sulfur Dioxide) and NO_x (Nitrogen Oxide) markets and the European Union’s CO₂ (carbon dioxide) market. These emissions markets are volatile and price fluctuates considerably. Market participants manage price risk through the use of derivative structures, such as forwards, futures, options, caps and floors. These derivatives are generally physically settled, because the current emissions market is primarily physical in nature....

The OCC has previously concluded in a variety of contexts that national banks may engage in customer-driven commodity transactions and hedges that are physically settled, cash-settled and settled by transitory title transfer.... Similarly, the OCC permitted a national bank to make and take physical delivery of

⁵⁵ The CFTC has occasionally brought enforcement actions for fraud in the spot market, but these are rare. The legislative history does not suggest that Congress meant the CFTC to be a regulator of cash commodity markets.

⁵⁶ See CFTC approval of CCFE application for designation as a Contract Market: *Order of Designation: In the Matter of the Application of the Chicago Climate Futures Exchange, LLC for Designation as a Contract Market*, November 9, 2004.

commodities in connection with transactions to hedge commodity price risk in commodity linked transactions....

In these decisions, the approved activities were subject to a number of conditions due to risks associated with physical transactions in certain commodities. Those risks included storage (e.g., storage tanks, pipelines), transportation (e.g., tankers, barges, pipelines), environmental (e.g., pollution, fumigation, leakage, contamination) and insurance (e.g., damage to persons and property, contract breach, spillage). Physical settlement of emissions derivatives and hedging with physicals would not pose those risks, however. Emission allowances are not tangible physical commodities, such as electricity or natural gas. Rather, they are intangible rights or authorizations. They can be bought and sold like other commodities, but they exist only as a book entry in an emissions account.⁵⁷ [footnotes omitted]

The Federal Reserve also considers emission allowances as commodities for purposes of trading.⁵⁸

Regulation of Trading Venues. The CFTC identifies four venues for trading exempt commodities under the Commodity Exchange Act: (1) Designated Contract Markets (DCM), (2) Commercial Derivatives Transaction Execution Facilities [none currently in operation], (3) Exempt Commercial Markets (ECM), and (4) Over-the-Counter (OTC) — not on a trading facility.⁵⁹ As suggested by the discussion above, allowances are traded on three of these venues. Futures contracts and clearing services are provided by NYMEX and CCFE — both DCMs — with options also available on the CCFE. ICE and TradeSpark — both ECMs — are used by brokers and principals for allowance transactions. Finally, principal-to-principal transactions and broker-assisted transactions are occurring OTC without the use of a trading facility. **Table 5** summarizes these venues and their regulation under the Commodity Exchange Act.

For the three trading venues set out in **Table 5**, the degree of regulation varies, most significantly according to the identities of the participants. Small public investors are allowed to trade only on regulated exchanges (DCMs); these are subject to extensive self-regulation and CFTC oversight. Electronic trading facilities, where small traders are not present, are subject to much less regulation, because traders are assumed to be capable of protecting themselves from fraud. However, if an electronic trading facility plays a significant price discovery role (that is, if the prices it generates are used as reference points by the cash market or other derivatives markets), the CFTC may require disclosure of certain information about trading volumes, prices, etc. Where trades are purely bilateral, negotiated, and executed

⁵⁷ Comptroller of the Currency, Administrator of National Banks, Interpretive Letter #1040: Emissions Derivatives Proposal, September 15, 2005.

⁵⁸ Board of Governors, Federal Reserve System, JPMorgan Chase & C. New York, New York: Order Approving Notice to Engage in Activities Complementary to a Financial Activity, November 18, 2005.

⁵⁹ See table entitled: *Venues for the Trading of Exempt Commodities under the Commodity Exchange Act (CEA)*, available on the CFTC website at [http://www.cftc.gov/stellent/groups/public/@newsroom/documents/file/exemptcommoditiesvenues_091207.pdf].

between principals, the transaction is said to occur in the OTC market, which is entirely exempt from CFTC regulation, with the exception of certain provisions dealing with fraud manipulation.

Table 5. Summary of Trading Venues for Exempt Commodities Under the Commodity Exchange Act (CEA)

	Designated Contract Markets (CEA Sec. 5)	Exempt Commercial Markets (CEA Sec. 2(h)(3)-(5))	OTC — Not on a Trading Facility (CEA Sec. 2(h)(1)-(2))
Commodities Permitted	No limitations	Exempt commodities (e.g., energy metals, chemicals, emission allowances, etc.)	Exempt commodities (e.g., energy metals, chemicals, emission allowances, etc.)
Method of Trading	Trading can take place on an electronic trading facility or by open outcry	Electronic multi-lateral trading (i.e., many-to-many platforms)	Non-multi-lateral trading (e.g., dealer markets; individually-negotiated, bilateral transactions)
Notice Requirement	Must apply to and receive prior approval from CFTC; must satisfy various non-prescriptive designation criteria and core principles	Yes; simple notice containing contact information and description of operations	None; exemption is self-executing
Participants	No limitations	Eligible Commercial Entities only — subset of Eligible Contract Participants; excludes individuals but includes funds	Eligible Contract Participants (i.e., institutions, funds, and wealthy, sophisticated individuals)
Intermediation	Permitted	None; principal-to-principal trading only	Limited; only if done through another Eligible Contract Participant

	Designated Contract Markets (CEA Sec. 5)	Exempt Commercial Markets (CEA Sec. 2(h)(3)-(5))	OTC — Not on a Trading Facility (CEA Sec. 2(h)(1)-(2))
Types of Transactions	Futures and options	Derivatives, including swaps, futures and options (Note: ECMs often also trade products outside CFTC jurisdiction, including spot and forward contracts)	Derivatives, including swaps, futures, and options
Standardized Products?	Yes	Yes, terms set by the entity	Usually yes when executed on a dealer market. Usually no, when executed bilaterally
Cleared?	Transactions must be cleared through a Derivatives Clearing Organization (DCO) approved by the CFTC	Clearing not mandatory; if offered, it must be through an SEC-registered clearing agency or a DCO (many ICE transactions are cleared at LCH; other ECMs offer clearing at NYMEX Clearport or The Clearing Corp.)	Can be if a standardized contract; many traders choose to clear trades at NYMEX or LCH
Transaction Prohibitions	Subject to all provisions of the CEA	Only anti-manipulation and anti-fraud	Only anti-manipulation and anti-fraud (but anti-fraud rules do not apply to transactions between Eligible Commercial Entities)

	Designated Contract Markets (CEA Sec. 5)	Exempt Commercial Markets (CEA Sec. 2(h)(3)-(5))	OTC — Not on a Trading Facility (CEA Sec. 2(h)(1)-(2))
Self-regulatory responsibility	Yes, significant self-regulatory responsibilities; must comply on an ongoing basis with 8 designation criteria and 18 core principles. Must have compliance and surveillance programs	Minimal and they include nothing that goes to the integrity of trading. Responsibilities include a reporting requirement for contracts over a minimum volume threshold; ensuring compliance with exemption conditions; and dissemination of contract activity information for “price discovery” contracts	None
Responsibility to CFTC	Comply with designation criteria and core principles	Provide notice of operation and weekly transaction data for high-volume contracts; report manipulations and fraud complaints; maintain and provide access to records of activity	None

	Designated Contract Markets (CEA Sec. 5)	Exempt Commercial Markets (CEA Sec. 2(h)(3)-(5))	OTC — Not on a Trading Facility (CEA Sec. 2(h)(1)-(2))
CFTC Oversight Authority	Unlimited, including continuous and ongoing market surveillance and trade practice programs, ability to intervene in markets (e.g., force reduction/liquidations of position, alter/supplement DCM rules). CFTC receives large trader reports transaction data and assesses DCMs' compliance programs via rule enforcement reviews	Limited (special calls); Sec 8a(9) emergency authority does not apply	None

Source: *Venues for the Trading of Exempt Commodities under the Commodity Exchange Act (CEA)*, available on the CFTC website at [http://www.cftc.gov/stellent/groups/public/@newsroom/documents/file/exemptcommoditiesvenues_091207.pdf].

Although allowances are regulated like any other commodity by the CFTC, it should be noted that it is not a deep liquid cash market. As noted by emissions broker Evolution Markets LLC, the affected source base for SO₂ allowances is about 500 companies. The broker also estimated in 2005 that about 20 companies represented the bulk of trading activities.⁶⁰ In recommending CFTC approval of the CCFE as a DCM, the Staff memorandum noted the following:

In futures markets generally, the existence of a liquid market for a particular contract and the ability of an FCM to liquidate positions therein which it may inherit from a defaulting customer are important to the financial integrity of such an FCM and, in turn, its ability to fulfill its obligations to other customers and to the clearing system. The EPA will facilitate the delivery process of these contracts in a manner that makes cash positions known and compensates for any current lack of a developed deep liquid cash market for the contracts as compared to other futures contracts. Collectively CCorp, NFA, and EPA will carry out financial surveillance, monitor situations, and provide information the effect of

⁶⁰ Evolution Markets LLC, "An Overview of Trading Activity and Structures in the U.S. Emissions Markets," NYMEX Emissions Futures Seminar, July 28, 2005.

which should counterbalance any disparate effects on financial integrity, which might be imposed by the initial lack of trading history and prices.⁶¹

Lessons and Observations from Title IV Program

Despite the tendency to view the Title IV program as a model for a future greenhouse gas reduction scheme, there are several important differences. For example, the Title IV program involves up to 3,000 new and existing electric generating facilities that contribute two-thirds of the country's SO₂ and one-third of its nitrogen oxide (NOx) emissions (the two primary precursors of acid rain). This concentration of sources makes the logistics of allowance trading administratively manageable and enforceable with continuous emissions monitors (CEMs) providing real time data. However, greenhouse gas emissions are not so concentrated. In 2005, the electric power industry accounted for about 33% of the country's GHG emissions, while the transportation section accounted for about 28%, industrial use about 19%, agriculture about 8%, commercial use about 6%, and residential use about 5%.⁶² Thus, small dispersed sources in transportation, residential/commercial and agricultural sectors, along with industry, are far more important in controlling GHG emissions than they are in controlling SO₂ emissions. This diversity multiplies as the global nature of the climate change issue is considered, along with the multiple GHGs involved.⁶³ Thus, a carbon market is like to involve far greater numbers of affected parties from diverse industries than the current Title IV program.

It will also involve far greater numbers of tradeable allowances than the current Title IV program. Under the current program, about **9 million** allowances are allocated to participating entities annually. In contrast, a domestic greenhouse gas program that capped emissions in the electric power, transportation, and industry sectors at their 1990 levels at some point in the future would be allocating about **4.85 billion** allowances annually. This is a two and a half orders-of-magnitude increase over the Title IV program and double the Phase 2 allocations under the ETS. Trading activities under Title IV has been increasing since 2005; however, the volumes don't approach those anticipated if a greenhouse gas cap-and-trade program were instituted.

Finally, the economic value of a future carbon market is likely to be substantially greater than the Title IV program. With EPA's pending implementation of the Clean Air Interstate Rule (CAIR), the price of a Title IV allowance has

⁶¹ The Division of Market Oversight and The Division of Clearing and Intermediary Oversight, CFTC, DCM Designation Memorandum: *Application of Chicago Climate Futures Exchange, LLC ("CCFE") for Designation as a Contract Market pursuant to Sections 5 and 6(a) of the Commodity Exchange Act ("Act" or "CEA") and Part 38 of Commission regulations*, November 3, 2004.

⁶² U.S. territories account for the remaining 1%. Data from EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005*, April 15, 2007, p. ES-14.

⁶³ The EU addresses this issue by having the ETS cover only 45% of its emissions and no non-carbon dioxide emissions, as noted earlier. Still, it has 11,500 entities to oversee.

increased to about \$500.⁶⁴ Thus, the annual allocation of SO₂ allowances has a market value of about **\$4.5 billion**. Using estimates of \$15 to \$25 an allowance, the annual allocation of 4.85 billion allowances posited above for a greenhouse gas program would have a market value of **\$72.8 billion to \$121.3 billion**.⁶⁵ Unlike the Title IV market, a carbon market may be quite liquid, particularly as the market expands globally.

Despite these differences in scope and magnitude, there are trends in Title IV trading that are likely to continue in a carbon market.

First, there is a trend toward more diverse, non-traditional participants in the Title IV market. Like the Title IV market, the economic importance of a carbon market will likely draw in entities not directly affected by the reduction requirements, such as financial institutions. The motivations of these entities may be equally diverse, including facilitating projects involving the need for allowances, portfolio balancing, and profits earned through intermediary fees or proprietary trading.

Second, there is trend in the Title IV market toward using financial instruments to manage allowance price risk. This trend is partly the result of the regulatory uncertainty introduced in the allowance market by CAIR. Given the greater economic stakes involved in a carbon market, this trend toward more sophisticated financial instruments is likely to emerge early as a hedge against price uncertainty. The emergence of entities well-versed in the use of these instruments may reinforce the trend and make options, collars, strangles, and other structures as common in the allowance market as they are in other commodity markets. With a more liquid and dynamic market, a carbon market may look more like other energy markets, such as natural gas and oil, than the somewhat sedate SO₂ allowance market.

Implications for a Future U.S. Carbon Market: Regulatory Issues

If the United States adopts a cap-and-trade system based on CO₂ allowances, the resulting trading market would be large. As noted above, between four and five billion allowances might be issued each year, with a market value of around \$70 to \$120 billion. Judging by the interest already expressed by major Wall Street firms, the value of secondary market trading might be several times that figure.

Since thousands of businesses would be affected by a mandatory emissions trading system, there is a strong public interest in ensuring that (1) the market functions smoothly and efficiently, generating prices that accurately reflect supply and demand for emissions permits, (2) the market is free from fraud and

⁶⁴ Based on data from Cantor Fitzgerald, October 2007.

⁶⁵ Range based on EPA estimates for reducing emissions to 1990 levels by 2020 as required under S. 280. See EPA, *Analysis of The Climate Stewardship and Innovation Act of 2007*, July 16, 2007. For reference, a Phase 2 ETS allowance currently sells for about 20-25 euro. Data from the European Climate Exchange, [http://www.ecx europe.com/default_flash.asp].

manipulation, which could potentially arise from a number of sources, including market power in the hands of a few firms and the abuse of nonpublic, price-sensitive information, and (3) market participants' and regulators' need for transparency is balanced against legitimate business concerns about the release of confidential, proprietary information.

An Efficient Trading and Pricing Mechanism

A generation ago, only a few large, established exchanges would have had the capacity to handle the trading volumes anticipated for a U.S. CO₂ market. That is no longer the case: thanks to cheap computing power and telecommunications, small firms with a few dozen employees can handle much of the volume of the major stock exchanges, which employ thousands. Thus, we can expect trading mechanisms to emerge quickly once U.S. carbon trading is authorized, with no need for government assistance.

A number of organizations and groups have been preparing for the advent of emissions trading. The Chicago Climate Exchange (CCX) already operates a voluntary greenhouse gas emissions market, featuring both spot and futures trading.⁶⁶ Cantor Fitzgerald, a securities firm that operates a secondary trading platform for U.S. Treasury securities, has formed a subsidiary, CantorCO2e, which offers “an integrated set of services — transaction, financing, technology and consultancy — to bring environmental commodities to market and to assist clients across the world in managing the financial aspects of energy and environmental choices.”⁶⁷ In December 2007, the New York Mercantile Exchange (Nymex), the leading U.S. energy futures market, announced the formation of the Green Exchange, in a joint venture with several major investment banks. The Green Exchange will offer environmental futures, options, and swaps, and expects to register with the Commodity Futures Trading Commission (CFTC) as a futures exchange in 2009.⁶⁸ IntercontinentalExchange (ICE) already owns and operates a CFTC-regulated futures exchange (the former New York Board of Trade), which specializes in sugar, cotton, and other agricultural commodities but could easily offer emissions-related contracts as well. Any of these entities would have little difficulty in hosting large-scale trading of emissions allowances.

Since start-up costs are relatively low, it is likely that a number of competing trading venues would emerge to handle U.S. emissions trading if the United States followed the EU's example and did not mandate a particular trading mechanism or structure. Competition would favor markets with low trading costs, easy access, and fast and reliable execution systems. The usual pattern in trading markets is for

⁶⁶ The CCX created the ECX in 2005. Since 2006, CCX and ECX have been owned by Climate Exchange PLC, a publicly traded company listed on the AIM division of the London Stock Exchange.

⁶⁷ [http://www.cantor.com/brokerage_services/co2e], visited February 29, 2008.

⁶⁸ “Nymex and Other Major Market Participants to Form the Green Exchange,” *PR Newswire*, December 12, 2007.

volume to gravitate to a single market, to enhance liquidity.⁶⁹ This suggests that the less successful competitors might be relegated to niche markets, that a number of trading mechanisms could be linked electronically to form a single market, or that mergers and acquisitions would reduce the number of trading venues.

It is of little public interest which firm or firms emerges as the market leader. What is important, however, is that there be an authoritative source of price information, since the price of emissions will guide firms considering investment in pollution abatement. Price discovery mechanisms are most efficient in liquid markets, where many traders bring information to the price-setting process by their buying and selling decisions.

In general, the functioning of the price mechanism has not been a concern of financial regulators.⁷⁰ The Securities and Exchange Commission (SEC) and the CFTC both rely on self-regulation by the exchanges in this area, reflecting the fact that the exchanges predate the federal regulators by decades or centuries. Both agencies have broad authority to intervene if they determine that prices do not accurately reflect the underlying forces of supply and demand.

If patterned after the Title IV program and the EPA maintained the registry of allowance ownership, that agency might play a role in price dissemination in a future carbon market. Reports to the EPA that a trade has occurred could be required to include price information, which could be published electronically. In practice, however, the EPA might not be the best source of price data. Since the EPA would presumably receive only spot market trade data, and since most proposals follow the Title IV procedure that specifies that each transaction report to the EPA must include a written certification of the transfer, signed by a responsible official of each party, the question arises whether prices generated by the EPA registry would be outdated by the time they were published. In practice, many commodity spot markets look to the futures exchanges for current prices; new prices are generated there second-by-second, recorded, and transmitted almost instantaneously. If substantial numbers of spot transactions took place on exchanges, as they do in Europe, current information on spot prices might also be available.

Regulators might have a role to play in ensuring that the exchanges did not charge excessive fees for access to real-time price data. Both the SEC and CFTC have grappled with this issue — customers tend to view the exchanges as public utilities, and prices as common goods, but the exchanges naturally look upon price data as their private property, to be sold for what the market will bear.

The availability of price information also depends on the regulatory status of the source market. Exchanges regulated by the SEC or CFTC are required to disclose

⁶⁹ In a liquid market, there are many buyers and sellers, and traders have less reason to fear that their order to sell will cause the price to drop before the order can be filled (or vice versa). For large traders in particular, the impact of their trade orders on the market price is a major component of total transaction costs.

⁷⁰ With the exception, of course, of the rare occasions when price manipulation is suspected, as discussed below.

price and volume data. (The proprietary issue mentioned above refers only to intra-day or real-time prices.) These rules do not apply with the same force to over-the-counter (OTC) markets, which are a significant presence in financial and energy derivatives markets, but which are largely exempt from CFTC regulation.⁷¹ Under current law, the CFTC has very limited authority to require OTC markets to disclose trading data. Legislation before the 110th Congress would require such disclosure by exempt markets that were determined by the CFTC to play a significant role in the price discovery process.⁷²

Fraud and Manipulation

Regulation of secondary emissions trading would have to consider two kinds of fraud and manipulation: fraud by traders or intermediaries against other investors, and sustained price manipulation, which is harmful not only to market participants, but potentially to consumers and the economy.⁷³

Investor Fraud. Both CFTC and SEC have extensive experience with numerous programs designed to prevent and punish fraud. Much anti-fraud regulation takes place in a self-regulatory framework: regulated exchanges are required to establish and enforce rules to promote fair trading. To choose two examples from a very long list of investor protection rules, securities brokers are bound by a duty of best execution — they are required to obtain the best terms reasonably available to fill a customer's order — while futures commission merchants are prohibited from trading for their own accounts when they have an unfilled customer order in hand. Many similar protections would apply to trades in emissions allowances or derivatives executed on a regulated exchange, whether futures or securities. Both types of markets require professional traders to maintain accurate records of all transactions. There is no strong reason to think that CFTC or SEC regulation would be superior in protecting small traders: either should be adequate.

In addition to federal statutes and regulations and the rules of self-regulating securities and futures exchanges, state laws provide protections against crooked dealings. Brokers, investment advisers, and other intermediaries are regulated at the state level in their transactions with customers, to prevent them from taking advantage of public investors with less knowledge of current market conditions.

The degree to which fraud on the unwary could be a problem depends on how many and what kinds of traders are attracted to the market. In the SO₂ market, it is not a significant problem. SO₂ emissions are primarily generated by relatively few

⁷¹ See CRS Report RS21401, *Regulation of Energy Derivatives*, by Mark Jickling, for a discussion of issues associated with unregulated OTC trading.

⁷² The Senate-passed version of H.R. 2419 (the Farm Bill) and an unnumbered bill to reauthorize the CFTC marked up and approved by the House Agriculture Committee in December 2007.

⁷³ This report does not address fraud outside the secondary markets, such as falsification of emissions data. The EPA would be the appropriate agency to oversee and verify emissions measurement.

power utilities, each of which has roughly the same information as the others. All see the same weather forecasts and energy price data. In such a market, it is difficult for one party to defraud another.

The CO₂ market would be different: there would be thousands of firms in the market, and potentially millions if the program were to cover transportation emissions. Assuming that significant information asymmetries exist between small firms in the market and large ones, the latter are likely to be in a position to take advantage of the former. Either SEC or CFTC regulation could be appropriate, depending on whether emissions allowances and derivatives came to be traded on securities or futures exchanges.

In OTC derivatives markets, where only sophisticated investors and institutions are allowed to trade,⁷⁴ participants are assumed to have the incentive and capacity to protect themselves from fraud.⁷⁵ This is the general rationale for exempting certain markets from regulation: if public customers are not present, there is thought to be no public interest in providing investor protection at the taxpayers' expense.

Spot market trades, which would not come under regulation under current securities or commodities law, are another area where abuses could arise from information asymmetries between large, sophisticated traders and smaller firms that rarely use the market. The potential for abuse, however, would be greatly reduced if current price data were easily available to all market participants.

Inside Information. The European experience suggests that there may be opportunities to trade on inside, non-public information. Even sophisticated market participants are vulnerable to this type of fraud. The concepts of insider trading, however, are not the same in securities and futures markets.

Under securities law, insider trading involves the use of nonpublic information about a single firm. Corporate insiders in possession of nonpublic information that is material — that is, that would affect a reasonable investor's decision to buy or sell — are prohibited from buying or selling the company's shares until the information is disclosed to the public. All trades by certain executives, officers, and directors in their own company's shares must be disclosed within two business days. The definition of who is an "insider" has been expanded by legislation and court decisions in recent decades, so that under certain circumstances investment bankers, journalists, and various fiduciaries may be encompassed.⁷⁶

⁷⁴ OTC traders must be "eligible contract participants," defined in the Commodity Exchange Act as financial institutions, market professionals, corporations with a net worth greater than \$1 million, or individuals with assets over \$1 million, or income over \$200,000.

⁷⁵ Both derivatives and securities are traded in private, less-regulated markets. Under federal securities law, companies may sell stocks or bonds to a limited number of institutional investors or wealthy individuals without having to register with the SEC.

⁷⁶ For a brief overview of the law, see CRS Report RS21127, *Federal Securities Law: Insider Trading*, by Michael V. Seitzinger.

In futures markets, there is no equivalent to inside information about a single corporation's prospects. Contracts are based on homogenous commodities that thousands of people produce, trade, and consume. Certainly some traders — large producers or industrial users of commodities — have information that others do not have, but the price discovery process depends on that information being incorporated into the price.⁷⁷

The Commodity Exchange Act and CFTC regulations bar exchange employees (or governing board or committee members) from trading on material nonpublic information obtained through their positions, or from “tipping” others to trade on such information.⁷⁸ This prohibition does not extend to everyone who trades in the market.

Because of the variance between futures and securities concepts of insider trading, if, hypothetically, the CEO of ExxonMobil were to buy stock knowing that the discovery of a major new oil field would be announced the next day, the transaction would be clearly illegal under the securities laws. If, however, in the same circumstances he sold crude oil futures contracts, expecting that the announcement would lower the price of oil, it would not necessarily be unlawful.

Thus, it is not certain that either the CFTC or the SEC approach to insider trading would be adequate to protect the market from the kind of abuse suspected in Europe before the allowance price crashed in 2006 (where traders may have used pre-publication data regarding emissions levels and allowance allocations). What may be required is a hybrid of securities and commodities law, imposing disclosure requirements on certain firms in possession of material nonpublic information.

Market Manipulation. Investor protection is not the only goal of anti-fraud regulation. Even though sophisticated investors in unregulated, private markets have the incentive and means to protect themselves against fraud by those with superior information, these markets may be just as vulnerable to price manipulation as the public markets. In recent years, there has been widespread concern in Congress and elsewhere that excessive speculation in energy derivatives may have caused the prices of oil and natural gas to be higher than the fundamentals of supply and demand would justify.⁷⁹

⁷⁷ There is a large theoretical literature, on both stock and futures markets, that argues that any restriction of insider trading is undesirable because it makes pricing less efficient.

⁷⁸ The “tippees” are likewise prohibited from trading on that information. See 17 CFR §159. (The definition of “material nonpublic information” is essentially the same as in securities markets.)

⁷⁹ See U.S. Senate Permanent Subcommittee on Investigations, *Excessive Speculation in the Natural Gas Market*, staff report, June 2007. The argument that manipulation has occurred is not universally accepted. See Written Testimony of Acting CFTC Chairman Walter Lukken and Commissioner Michael Dunn before the Permanent Subcommittee on Investigations, Senate Committee on Homeland Security and Governmental Affairs, July 9, 2007

[<http://www.cftc.gov/stellent/groups/public/@newsroom/documents/speechandtestimony> (continued...)]

Allowance price manipulation would resemble the kind of manipulation that the CFTC is equipped and accustomed to prevent, detect, or punish. Allowance prices would be subject to corners and squeezes to the same extent as any commodity contract, assuming that allowances were issued in advance, as they are in Europe, and that the supply could not be expanded before the beginning of the next allocation cycle. To corner the market, a manipulator would amass a large inventory of allowances while simultaneously taking futures or forward positions that required others to make delivery to it. When a squeeze is successful, traders with delivery obligations have no choice but to buy from the manipulator at prices it can dictate, and then sell those same allowances back to the manipulator at the lower prices specified in the futures and forward contracts.

To prevent manipulations of this type, which can cause prices of the underlying commodity (emissions, in this case) to rise far above fundamental levels for extended periods of time, the CFTC has a number of surveillance programs that apply to both the spot and futures markets. First, the CFTC maintains a large trader reporting system: anyone controlling more than a specified number of contracts must report the position daily. This information is not made public, but it allows the CFTC to observe the accumulation of large positions that could serve as the basis for manipulation. CFTC is able to aggregate positions held by a single trader with various brokerage firms. Second, the CFTC monitors the deliverable supply of commodities, particularly as the expiration date of the futures contract draws near. If unusual shortages in deliverable supply emerge, the CFTC can take certain remedial steps.⁸⁰ However, the CFTC does not have the capacity (nor a clear statutory mandate) for comprehensive monitoring of spot trading in all the commodities upon which futures contracts are based.

The futures exchanges and clearing houses have strong incentives to prevent manipulation — since futures trading is a “zero-sum” game,⁸¹ victims of manipulated prices will almost certainly include many exchange members. Clearing houses, which guarantee payment on all contracts, face the risk that a squeeze or corner may cause many traders to default on their obligations.

To deter manipulation, the exchanges impose position size limits on certain contracts, but these apply only to speculators. Hedgers, those who produce or deal in the underlying commodity, are generally exempt. In the allowance market, as noted above, a concern is that a single large emitter, or a group acting in concert, could have enough market power to influence prices. If concentration in the allowance market is significantly greater than in other commodities, a system of position limits that applies to hedgers might be useful.

⁷⁹ (...continued)

/opalukken-26.pdf], visited March 3, 2008.

⁸⁰ For an overview of the CFTC’s anti-manipulation tools, see “Written Testimony of Acting CFTC Chairman Walter Lukken and Commissioner Michael Dunn before the Permanent Subcommittee on Investigations,” July 9, 2007.

⁸¹ All futures contracts are bilateral, and any given price movement causes equal but opposite gains and losses to the two sides.

SEC anti-manipulation efforts, on the other hand, are generally not aimed at manipulations of an entire market, but at the schemes to distort the price of a single stock, or group of stocks. Many such manipulations deal with misuse of inside information or spreading false information. There is no general equivalent to the CFTC's large trader reporting system, although buyers of more than 5% of a public company's shares must disclose their ownership and state whether the investment is passive or whether control of the company is sought.

The Energy Policy Act of 2005 (P.L. 109-58) significantly expanded the authority of the Federal Energy Regulatory Commission (FERC), giving the agency a new role in regulating energy markets. The act expanded the jurisdictional reach of FERC, authorizing it to address any manipulative device and any entity participating in or affecting FERC's jurisdictional markets (primarily bulk electricity and interstate natural gas). FERC also received new civil authority to impose penalties of up to one million dollars per violation per day. FERC oversees power markets that involve extensive administrative adjustments to regional markets through market monitors, but not markets that would be characterized as exchanges.

Even before the 2005 Act, beginning in 2002, FERC had built a new analytic capability to examine markets and look for anomalies in response to the Enron and California electricity crises. FERC established a Market Oversight unit, which grew to approximately 50 staff. To comply with its new regulatory mission under the 2005 Act, resources were shifted to emphasize enforcement and audit activities. As a result, the market oversight unit lost staff and has continued to shrink, to perhaps a dozen full time professionals at this time.

Though it is relatively inexperienced as a regulator of secondary markets, FERC might play a key role in coordination with another agency (or agencies). Since the prices of natural gas and wholesale electricity would be affected by emissions costs (and vice versa), the possibility of intermarket price manipulation exists. Without the information available to FERC, it will be difficult to obtain a comprehensive overview of supply and demand in the emissions market.

If an OTC market for allowance derivatives were to develop, no federal agency would have much authority over it, or much information about trading volumes, prices, and market conditions. The extent to which existing OTC markets in financial and energy markets facilitate manipulation is controversial.⁸² It is clear that the exchange and OTC markets are economically linked and that swaps and futures are interchangeable from the trader's point of view, and that therefore prices in one market affect the other. Some argue that OTC manipulation is unlikely because all participants are sophisticated and because manipulation of exchange market prices, which are visible and often used in the spot market, is likely to be more profitable. Others argue that the less-transparent OTC market is where a would-be manipulator might choose to accumulate market power, out of the regulator's sight. In any case, the issue is now squarely before the Congress, and emissions trading is unlikely to present any strategies for manipulation not already found (or suspected) in the energy market.

⁸² See CRS Report RS21401, *Regulation of Energy Derivatives*, by Mark Jickling.

Transparency Versus Confidentiality

In order for the cap-and-trade system to work, firms must have clear price signals to guide their investment decisions. Reliable and transparent prices also foster liquid secondary markets, which in turn can make pricing more efficient.

To public investors and customers, transparency means primarily the availability of timely and affordable price information. Without such information, they are prey to better-informed market insiders. Both SEC and CFTC have well-established standards in this area.

The more difficult issue is how much information the public needs about how prices are set. Confidence in the market depends on investors believing that prices are determined fairly, in response to real economic factors, and not manipulated. Providing that assurance is a major function of the regulators.

But there are limits to transparency; beyond a certain point, it becomes very expensive and may harm the market. The discussion above about the market impact of large trades is one example of this. Large traders prefer to trade anonymously, in order that other traders not jump in and sell when they are selling, or buy when they are buying, raising their transactions costs. In the stock market, a number of electronic trading venues have thrived in competition with the major exchanges by offering anonymity to large institutional traders. The potential danger here, however, is that a fragmented, or two-tier, market may evolve, where market professionals and large traders deal with each other at prices better than those they offer to the public.⁸³

Regulators also want information that traders would prefer to keep private. Large positions in futures, as noted above, are reported to the CFTC but not made public. There have been no instances to date of trading abuses involving mishandling of large trader data.

In the emissions market, government agencies would have access to large amounts of price-sensitive data. The EPA, first of all, would have full information about the total number of allowances to be issued, and how they were to be allocated. It would also have data on actual measured emissions, which could send important price signals under certain market conditions.

Safeguarding this kind of information, however, need not present any special regulatory problems. Many federal agencies already generate statistics and forecasts that affect market prices — macroeconomic and agricultural data are examples — and existing procedures and laws appear to work well to prevent pre-publication leaks.

⁸³ This was the case a few years ago with Nasdaq and Instinet, a trading system used only by Nasdaq intermediaries. The SEC responded by requiring that Nasdaq trading screens display price quotes from all electronic marketplaces handling Nasdaq shares.

Concluding Remarks

Both the European Union's Emissions Trading Scheme and the U.S. Title IV sulfur dioxide program have insights into regulatory issues that may face any future U.S. carbon market. A review of the initial operations of the EU-ETS indicates some potential pitfalls facing a future U.S. market. The 2006 price crash, by weakening the financial incentive to reduce pollution, undermined the basic rationale for the ETS. Although the problem did not originate in the secondary market, it did raise questions about the adequacy of market regulation. In particular, many observers suspect that information about the size of allocations leaked before official publication, and that certain traders profited from this knowledge. Traders with nonpublic information on certified emissions data — which gives an indication of future demand for allowances — may also have profited.

A review of Title IV's much longer trading history reveals at least two trends that are likely to continue in a carbon market and to challenge regulators. First, there is a trend toward more diverse, non-traditional participants in the Title IV market. Like the Title IV market, the economic importance of a carbon market will likely draw in entities not directly affected by the reduction requirements, such as financial institutions. These entities' motivations may be equally diverse, including facilitating projects involving the need for allowances, portfolio balancing, intermediary fees, and trading profits.

Second, as noted, there is a trend in the Title IV market toward using financial instruments to manage allowance price risk. Given the greater economic stakes involved in a carbon market, this trend toward more sophisticated financial instruments is likely to emerge early as a hedge against price uncertainty. The emergence of entities well-versed in the use of these instruments may reinforce the trend and make options, collars, strangles, and other structures as common in the allowance market as they are in other commodity markets. With a more liquid and dynamic market, a carbon market may look more like other energy markets, such as natural gas and oil, than the somewhat sedate SO₂ allowance market.

Regulation of secondary emissions trading would have to consider two kinds of fraud and manipulation: fraud by traders or intermediaries against other investors, and sustained price manipulation, which is harmful not only to market participants, but potentially to consumers and the economy. Four federal agencies could have roles in the regulation of a secondary market in emissions allowances. Each has attributes that may contribute to effective regulation.

The CFTC is the agency that currently oversees the Title IV program and whose current mission most closely resembles what a regulator of the prospective carbon emissions market would do. Secondary CO₂ trading in the EU does not appear to differ significantly from other commodities markets. CFTC is engaged in intermediary regulation, has experience in market surveillance to prevent or detect fraud and manipulation, and supervises a market system — based on the self-regulating exchange and clearing house — that has withstood severe financial shocks.

The major failing of the CFTC, according to some observers, is that it lacks the resources and the statutory mandate to do its job.⁸⁴ Futures trading has grown explosively in recent years; CFTC employment and budget have not kept pace. The OTC derivatives markets represent another major challenge. Many believe that the CFTC's limited jurisdiction over the OTC markets constitutes a regulatory gap, and that excessive, unregulated speculation in energy contracts may be partly to blame for high and volatile energy prices.

The SEC is much larger than the CFTC, and its enforcement programs are widely thought of as more effective than the CFTC's. While the CO₂ market will resemble commodities markets more closely than securities, the SEC has a number of regulatory tools that might be appropriately applied to the emissions market. These include regulation of insider trading and disclosure of material formation by firms in the market. It is likely that SEC-regulated investment banks will play a significant role in the development of a U.S. carbon trading market, as they increasingly are doing in the Title IV market. It is also possible that CO₂ derivatives contracts or indexes could be listed and traded on securities exchanges.

If patterned after the Title IV program, EPA would be responsible for the primary market in allowances: the original allocation and/or auction of permits to emitting firms. It would maintain the registry of ownership of allowances. EPA lacks experience comparable to that of the CFTC and SEC in regulating trading markets, but the information it gathers in the primary market could be critical to oversight of the secondary market.

FERC was granted oversight authority over bulk electricity and interstate natural gas markets in 2005. Its experience with market surveillance and enforcement is thus limited in comparison to the SEC and CFTC, and it does not play an active role in overseeing the Title IV market. FERC may have a role to play, however, based on its oversight of commodity markets with price linkages to CO₂ emissions, but at this time it may be less well-equipped than the CFTC or SEC to be the primary regulator of secondary trading.

If development of secondary trading is left to market forces, as it was in Europe, it is possible that no single regulator would have clear jurisdiction, as is the case in the Title IV program. CO₂-related contracts, as well as the allowances themselves, could be traded simultaneously on futures and securities exchanges, spot markets where EPA has some jurisdiction, and OTC markets that are essentially unregulated.

This kind of regulatory fragmentation has not always worked well in financial markets. After the stock market crash of 1987 revealed differences of opinion among the CFTC, the SEC, and the Federal Reserve, President Reagan created the President's Working Group on Financial Markets,⁸⁵ which remains active, conducting

⁸⁴ See, e.g., U.S. Government Accountability Office, *Commodity Futures Trading Commission: Trends in Energy Derivatives Markets Raise Questions About CFTC Oversight*, GAO-08-25, October 2007, 83 p.

⁸⁵ The Working Group includes the chairmen of the Fed, SEC, and CFTC, and the Secretary (continued...)

studies and making recommendations on intermarket issues, as well as providing a forum for regulatory coordination. A similar umbrella group might help to prevent regulatory gaps or conflicts in the emissions market.

<http://wikileaks.org/wiki/CRS-RL34488>

⁸⁵ (...continued)
of the Treasury.

Appendix: Regulation of EU Emissions Exchanges

European Climate Exchange (ECX)

ECX is recognized as the leading secondary market for emissions trading, but it is not itself an organized financial exchange. ECX contracts are traded on the platform of another market, ICE Futures Europe, a Recognised Investment Exchange in the U.K., supervised by the Financial Services Authority (FSA) under the terms of the Financial Services and Markets Act of 2000.

“Recognition” as an investment exchange is contingent upon meeting FSA standards regarding financial resources, controls over systems and conflicts of interest, investor protections, fair access to trading facilities, trade recording, disclosure, custody of customer funds, disciplinary programs, and prevention of fraud and financial crime.

The parent company, IntercontinentalExchange, Inc., is an American firm headquartered in Atlanta. ICE Futures Europe was previously the International Petroleum Exchange, the leading European energy derivatives market. In addition to ICE Futures, ICE operates an OTC electronic platform, which is registered as an exempt commercial market under the U.S. Commodity Exchange Act and the regulations of the CFTC. The CFTC generally oversees, but does not substantively regulate, the trading of OTC derivative contracts on the ICE platform. All ICE participants must qualify as eligible commercial entities, as defined by the Commodity Exchange Act, and each participant must trade for its own account, as a principal. The U.K.’s FSA does not supervise the OTC emissions market.

Under FSA rules, derivatives trading is a “regulated activity,” which can only be carried out on a recognized exchange. Traders also need FSA authorization to participate in derivatives markets if they engage in a “specified activity,” including (1) dealing in investments as principal; (2) dealing in investments as agent; (3) arranging deals in investments; and (4) advising on investments. There are exemptions from this authorization requirement for hedgers, or those who use derivatives to mitigate risks in their normal course of (unregulated) business.

ICE operates its sales and marketing activities in the U.K. through ICE Markets which is authorized and regulated by the FSA as an arranger of deals in investments and agency broker.

ECX, through ICE Futures, offers futures contracts and options based on EUAs. One contract represents 1,000 tonnes of CO₂ EU Allowances, or 1,000 EUAs. ECX is not a spot market.

BlueNext

BlueNext was formed in December 2007, when NYSE Euronext (the holding company that owns the New York Stock Exchange) and Caisse des Depot (the French government’s investment company, or sovereign wealth fund) purchased the weather and carbon trading operations of Powernext, an exchange that trades spot

and futures contracts in electricity and natural gas. BlueNext is currently the leading spot market for EUAs, but expects to add EUA futures contracts and contracts based on CERs during 2008.

Like Powernext, BlueNext is classified as an investment company which manages a multilateral trading facility, and is registered with the Comité des Etablissements de Crédit et des Entreprises d'Investissement under the oversight the Autorité des Marchés Financiers (AMF), or Financial Market Authority. The Commission de Régulation de l'Energie (CRE) and the DIDEME (French Ministry of Finance) also have regulatory roles.

General organization and operating principles of trading markets are established by the AMF through its "Règlement général." The AMF's membership comprises various professional categories involved in the securities market such as exchange intermediaries, industrial and commercial firms, institutional investors and employees' representatives. The sixteen members of the AMF are appointed for a four-year period by decree of the ministry in charge of Economy and Finance.

The AMF is responsible for the proper working of regulated exchange markets. It supervises compliance with exchange rules and regulations by investment companies operating in France, and exchange compliance with the AMF's own rules. It has the power to impose sanctions on violators.

Nord Pool

Nord Pool was the first exchange to trade emissions allowances, but it has not kept up with ECX and BlueNext in trading volume. It offers spot forward contracts for EUAs and CERs (where actual delivery of an allowance always occurs), in addition to its primary business, which is spot trading of electrical power among the Nordic countries.

As a regulated exchange, Nord Pool maintains a market surveillance operation, and reports formally to the Norwegian Kredittilsynet (Financial Supervisory Authority) and the NVE (the Norwegian energy regulator).

Market participants are required to report all non-exchange (OTC) trades, to disclose all inside information that is likely to have a price impact, and to refrain from trading while holding such information. The exchange provides a mechanism for disclosing price-sensitive information, called the Urgent Market Message (UMM), which can be sent any time day or night. Price manipulation is defined in Nord Pool rules and prohibited.

Nord Pool also operates a clearing house, which clears both exchange and OTC transactions and is registered with the Kredittilsynet.

European Energy Exchange (EEX)

The EEX, in Leipzig, Germany, operates a spot market for EUAs, in addition to a natural gas spot and futures market. Under German law, the exchange maintains

a Market Surveillance Department (HUSSt), which is autonomous and independent of the exchange itself. HUSSt reports twice a month to the exchange supervisory authority, which is part of the Saxon Ministry for Economic Affairs and Labor. The supervisory authority conducts inspections and issues instructions to the exchange's management board, and may order HUSSt to conduct investigations. HUSSt's investigative authority extends beyond members of the exchange to anyone who may be involved in suspicious circumstances or grievances involving exchange trading or settlement.

HUSSt also reports to the federal Financial Supervisory Authority (BaFin).

Because of the number of international trading participants, HUSSt reports regularly to a range of foreign financial and energy regulators, including the U.S. CFTC.