RGGI Inc.

REPORT ON THE SECONDARY MARKET FOR RGGI CO_2 ALLOWANCES

Prepared for:

RGGI, Inc., on behalf of the RGGI Participating States

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The Regional Greenhouse Gas Initiative (RGGI) is a cooperative effort by participating states to reduce emissions of carbon dioxide (CO_2), a greenhouse gas that causes global warming.

RGGI, Inc. is a non-profit corporation created to provide technical and administrative services to the CO_2 Budget Trading Programs of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont.

A. INTRODUCTION

The primary market for RGGI allowances consists mainly of the auctions where allowances are initially sold. Once an allowance is purchased in the primary market, it can then be resold in the secondary market. The secondary market for RGGI allowances comprises the trading of physical allowances and financial derivatives, such as futures and options contracts.

The secondary market is important for several reasons. First, it gives firms an ability to obtain allowances at any time during the three months between the RGGI auctions. Second, it provides firms a way to protect themselves against the potential volatility of future auction clearing prices. Third, it provides price signals that assist firms in making investment decisions in markets affected by the cost of RGGI compliance.

This report provides a summary of activity in the secondary market in the first quarter of 2009 and discusses the results of our market power screens. Several patterns have emerged in this period in the secondary market:

- The volume of trading continued to grow in the first quarter of 2009. The average volume of allowance futures trading on the Chicago Climate Futures Exchange ("CCFE") grew from 303,000 allowances per day in December 2008 to 979,000 per day in March 2009.
- Although the volume of trading on the CCFE has risen considerably, the total volume of futures contracts traded in the first three months of 2009 (33 million) is still modest compared to the number of allowances auctioned in the same period (34 million).
- Market price volatility declined significantly from the last quarter of 2008 to the first quarter of 2009.
- By the end of the first quarter of 2009, 26 firms held a significant quantity of futures and options contracts on the CCFE. This is a positive sign for the competitiveness of the secondary market at this early stage.

In the initial period of trading in the secondary market, we find no evidence of anticompetitive conduct. Participation by a large number of firms is an encouraging sign of competitiveness and efficiency in the secondary market. Nevertheless, we will continue to evaluate the competitiveness of the market.

B. BACKGROUND

The secondary market for RGGI allowances comprises the trading of physical allowances and financial derivatives, such as futures and options contracts. A physical allowance trade occurs when the parties to the transaction register the transfer of ownership in RGGI's CO_2 Allowance Tracking System ("COATS"). Futures, options, and other financial derivatives are called "exchange-traded" when they are traded on a public exchange, and are called "over-the-counter" ("OTC") when they are not traded on one of the public exchanges. Many financial derivatives eventually result in the transfer of physical allowances (i.e., the transfer is registered in COATS), but this may occur months or years after the parties enter into a transaction.

Standard futures and options contracts are traded on two public exchanges: the Chicago Climate Futures Exchange ("CCFE") and the Green Exchange, an initiative of the New York Mercantile Exchange ("NYMEX"). Three categories of standard contracts are traded on public exchanges:

- Futures – Under these contracts, two parties agree to exchange a fixed number of allowances of a certain vintage year at a particular price at a specific point in the future (called the "delivery month"). At the end of the delivery month, the contracted number of allowances must be physically transferred to the buyer's account in the COATS registry and funds must be transferred to the seller. The vintage year refers to the compliance year of the allowance that is to be transferred.
- Call Options – Call options give the purchaser the option to buy a fixed number of allowances of a certain vintage year at a particular strike price at any time prior to the expiration date. For example, suppose a firm holds a call option with a 2009 vintage year, $5 strike price, and June 2009 expiration date. If the price of the corresponding futures contract rose to $5.75, the firm could exercise the option to buy allowances at $5 and immediately sell them at $5.75. Alternatively, if the price of the futures contract stayed below $5, the firm would let the option expire without exercising it.
- Put Options – Put options are similar to call options but they give the purchaser the option to *sell* a certain number of allowances of a particular vintage year at a specified strike price any time prior to the expiration date.

Futures and options contracts are important because they allow firms to manage risks associated with unforeseen swings in commodity prices. Futures allow firms to lock-in the prices of future purchases or sales. Options allow firms to limit their exposure to price volatility. Call options

protect the purchaser if the price of the commodity increases, while put options protect the purchaser if the price of the commodity decreases. Although options provide less certainty than futures contracts, they usually require less financial security, making them more attractive to some firms.

Public exchanges are attractive to firms that need a simple way to trade standard products. Moreover, public exchanges effectively eliminate the risk of default by counter-parties, since the exchange constantly monitors the account holdings of each participant to ensure that they have posted sufficient financial security to meet their obligations.

OTC trading is attractive to firms that prefer contracts with non-standard provisions. Firms with on-going business relationships may have other ways to manage the risk of default by the other party. Compliance entities may prefer to buy RGGI allowances bundled with other goods and services from their fuel suppliers or operations service providers. The OTC market allows parties to create contracts specifically tailored to their needs. In general, much more information is available about trading on public exchanges than trading in the OTC market.

C. SUMMARY OF PRICES

This section of the report summarizes prices in the secondary market for RGGI allowances during the first quarter of 2009. For context, the figures in this section also show prices from December 2008 and through the first full week of April 2009 when settlement occurred for futures contracts for March 2009 delivery.[1] Figure 1 summarizes prices in the secondary market during the period. The light blue line shows the closing price on each trading day of the CCFE futures contract with delivery at the end of the month.[2] Futures prices are not shown for the Green Exchange where very few contracts have been traded thus far. The squares show the volume-weighted average price of physical deliveries to COATS on each day when a trade occurred and where the parties recorded the transaction price.[3] For comparison, Figure 1 also shows the clearing prices in the RGGI auctions held on December 17 and March 18.

Most information about RGGI allowance prices comes from the trading of standard futures contracts on the CCFE. The simple average closing price for the study period shown in Figure 1 was $3.71. CCFE futures prices were volatile from the inception of the RGGI futures contract in August through the end of 2008, while prices have remained in a more narrow trading range since early January. The highest closing price shown in Figure 1 was $4.33 on December 1 and the low was $3.26 on December 17. The average daily change (up or down) in the closing price declined from $0.09/day in December 2008 to $0.05/day in March 2009.

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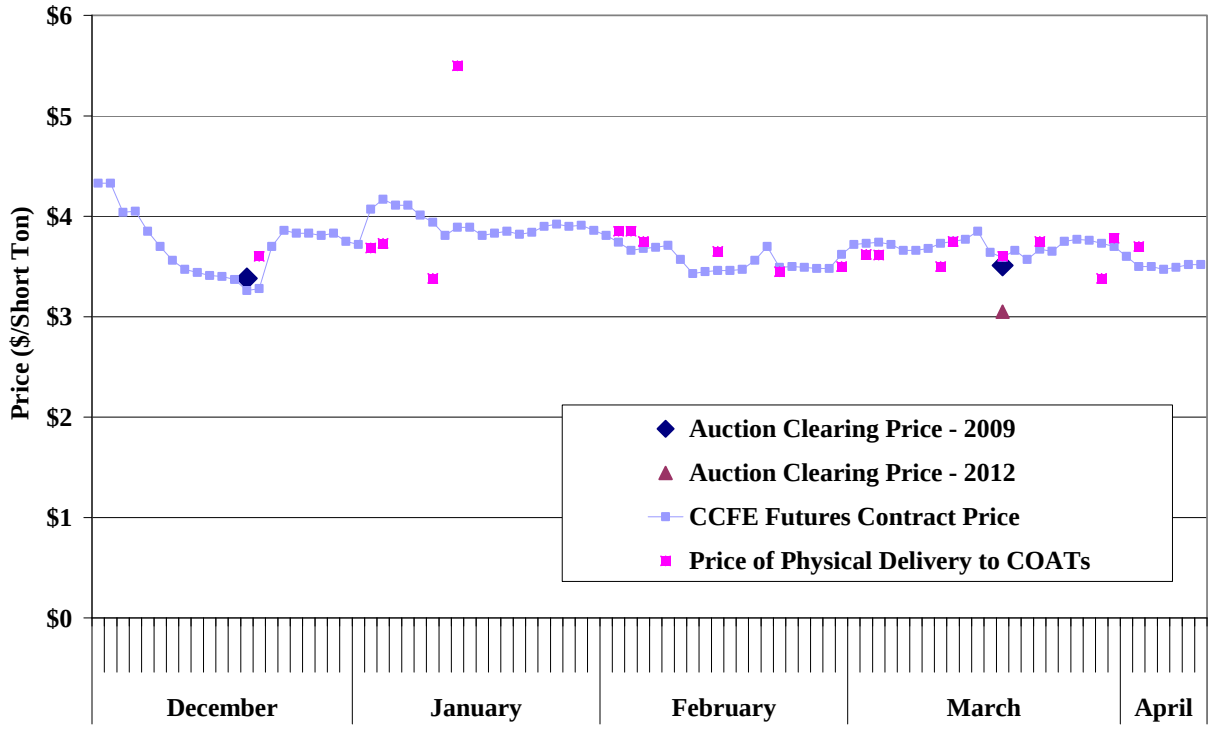
1 In this case, the first full week was shortened because the market was closed for the Good Friday holiday on April 10.

2 For instance, in January, the price of the futures contract for January 2009 delivery is shown. Likewise, in February, the price of the contract for February 2009 delivery is shown.

3 Parties are required to report the transaction price if there is an underlying financial transaction related to the transfer of allowances between accounts.

Figure 1: Prices in the Secondary Market for RGGI Allowances
December 1, 2008 to April 9, 2009



Sources: Auction clearing prices are available at "www.rggi.org/co$_2$-auctions/results", CCFE futures contract prices are available at "www.ccfe.com/mktdata_ccfe/futuresSummary.jsf?symbol=rggi", and the prices of physical deliveries to COATS are based on information in COATS available at: https://rggi-coats.org/eats/rggi/

The clearing prices in the December 17 and March 18 auctions for the vintage 2009 allowances were consistent with prices in the secondary market. Furthermore, the variability in secondary market prices in the two weeks preceding the auctions has declined since the September 2008 auction.

Figure 1 also shows the clearing price for the vintage 2012 allowances that were sold in the March 18 auction, which was low relative to prices in the secondary market. During the period shown, the only CCFE contract for vintage 2012 allowances that has traded is the one for December 2012 delivery. Although this contract was relatively illiquid, it tracked closely with the contract for vintage 2009 allowances for December 2012 delivery, implying that the futures market places a similar value on vintage 2009 and vintage 2012 allowances.[4]

[4] There is no directly comparable CCFE futures contract, which would be a contract for vintage 2012

The results of the March 2009 auction appear to have been more consistent with the expectations of the market than the results of the December 2008 auction. From the close of the CCFE on the day preceding the announcement of the December 2008 auction clearing price to the close of the market after the announcement, the futures price increased $0.41, indicating that the result was higher than expected. Conversely, after the announcement of the March 2009 auction clearing price, the futures price closed just $0.09 lower than the previous day, indicating that the result was consistent with expectations.

Additionally, we reviewed OTC transaction prices reported by Point Carbon[5] and Platts[6] which have been very consistent with the CCFE futures prices for comparable contracts.

Although the prices of most physical deliveries to COATS have been consistent with the prices reported by the CCFE, others have been significantly higher or lower. For example, it is unclear why a small quantity of allowances was transferred at a price of $5.50 on January 14. It is possible that this trade resulted from the exercise of a put option with a $5.50 strike price, or that the terms of the contract may have bundled the sale of allowances with additional services that raised the price of the transaction. The usefulness of the transaction prices reported in COATS is limited by the fact that transferring parties do not necessarily report all important details related to the transaction. Many of the transfers recorded in COATS have occurred at the beginning of the month on the designated delivery days for CCFE futures contracts. In most cases, the prices recorded for these transfers are the final settlement prices[7] for the associated futures contracts.

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allowances with March 2009 delivery. The most comparable contract is the CCFE's contract for vintage 2012 allowances with December 2009 delivery, although no trades of this contract have occurred on the CCFE.

5 An OTC price assessment for December 2009 delivery is published weekly by Point Carbon's in "Carbon Market North America."

6 Platts collects OTC data that is available by subscription.

7 On the delivery day of a RGGI futures contract, the buyer must pay for the allowances according to the settlement price on the expiration day of the contract. Once transfer of the allowances in COATS has been confirmed, this payment is passed on to the seller. See Rule 2607 in the CCFE Rulebook.

However, each transfer recorded in COATS likely resulted from multiple futures transactions during the preceding months, which could have occurred at a range of different prices.

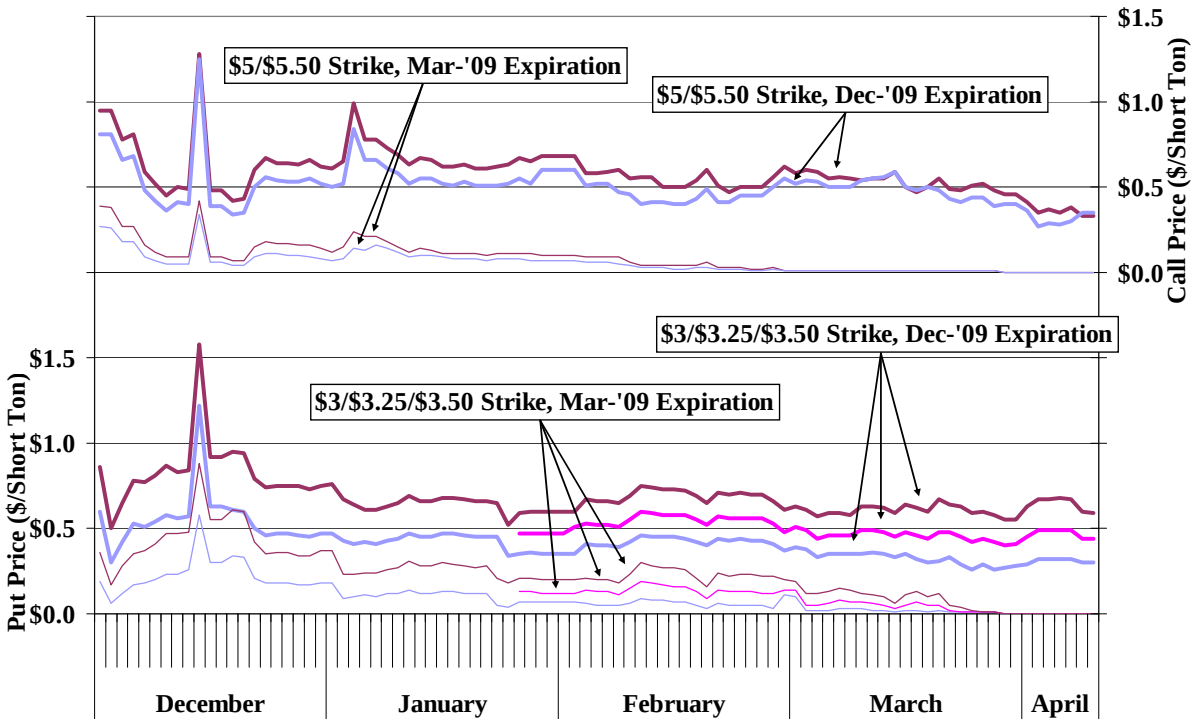
Prices in the secondary market are driven by expectations of the value of allowances in the future. Expectations are affected by information about the market, including the clearing prices in the RGGI auctions. For this reason, it is important, as with any commodity market, to disseminate sensitive market information in a predictable manner that does not confer advantage on any group of market participants. Thus, it is the practice of RGGI to publicly announce the clearing price of the auction on its website at a pre-specified time, and then subsequently communicate with auction participants regarding the results of the auction. On March 20, there were technical difficulties with the RGGI website, resulting in clearing prices not being posted until approximately 40 minutes after all auction participants and other interested parties on the RGGI, Inc. email distribution list received emails referring to the clearing prices. Later the same day, RGGI announced that in the event of similar technical problems in the future, it will delay posting the results until a later pre-specified time, and it will refrain from individual communications until the results are posted on the RGGI website.

In this case, it would be very difficult to determine whether any firm sustained actual harm. However, the pattern of futures trading suggests that any such harm would have been minimal since futures prices were not driven substantially higher or lower by news of the clearing prices. For example, the last trade on the CCFE prior to the time when the announcement was expected was for vintage 2009 allowances for December 2009 delivery at a price of $3.75. Over the remainder of the day, the same contract traded at prices ranging from $3.60 to $3.79. Hence, it appears that the auction results were consistent with expectations. If the result had been more surprising, it would have more likely given some market participants an unfair advantage.

Figure 2 summarizes the prices of ten options contracts at the close of the trading day from December 1, 2008 to April 9, 2009, although a total of 22 different options contracts were traded during the period. Figure 2 illustrates how option prices vary by the strike price and expiration date and how they respond to news affecting the outlook for RGGI allowances. The top half of the figure shows the prices of four call options, two with strike prices of $5.00 and two with

strike prices of $5.50. The bottom half of the figure shows the prices of six put options, two with strike prices of $3.00, two with strike prices of $3.25,[8] and two with strike prices of $3.50. For each strike price, two expiration dates are shown: March 2009 expiration and December 2009 expiration.

Figure 2: Prices of Put and Call Options for RGGI Allowances
December 1, 2008 to April 9, 2009



Source: Options prices are available at "www.ccfe.com/mktdata_ccfe/optionsSummary.jsf?symbol=rggi".

Figure 2 shows the importance of the strike price to the value of an option. For an option with a particular expiration date, a lower strike price makes a call option more valuable and a put option less valuable. For example, the call options with December 2009 expiration (the two thick lines in the top half of Figure 2) track closely throughout the period, with the $5.00 strike option trading at a modest premium over the $5.50 strike option for most of the period and converging briefly in the middle of March.

[8] The CCFE did not list the put option with a $3.25 strike price until on January 27, 2009.

The expiration date of an option also greatly affects its value. The options with the earlier expiration date (March 2009) are substantially less valuable than the comparable options with a later expiration date (December 2009). For example, by March 1, 2009 the call options shown above with March 2009 expiration had dropped near zero, because allowance futures were trading below $4 and it seemed unlikely that the price would move sufficiently for it to be profitable to exercise the option. In contrast, on March 1, 2009, the comparable call options with December 2009 expiration were available at $0.58 for a $5.00 strike price and at $0.52 for a $5.50 strike price, reflecting considerable uncertainty about allowance prices over the subsequent 10 months.

Fluctuations in option prices provide insight about how the market expects the price of the underlying commodity to behave. The price of an option depends on two factors: (i) the expected value of the underlying commodity relative to the strike price, and (ii) the expected volatility of the underlying commodity over the period before the expiration date. When call option price decreases coincide with put option price increases, it signals a decrease in the expected price of the underlying commodity. For example, this occurred when the futures price declined in early February.

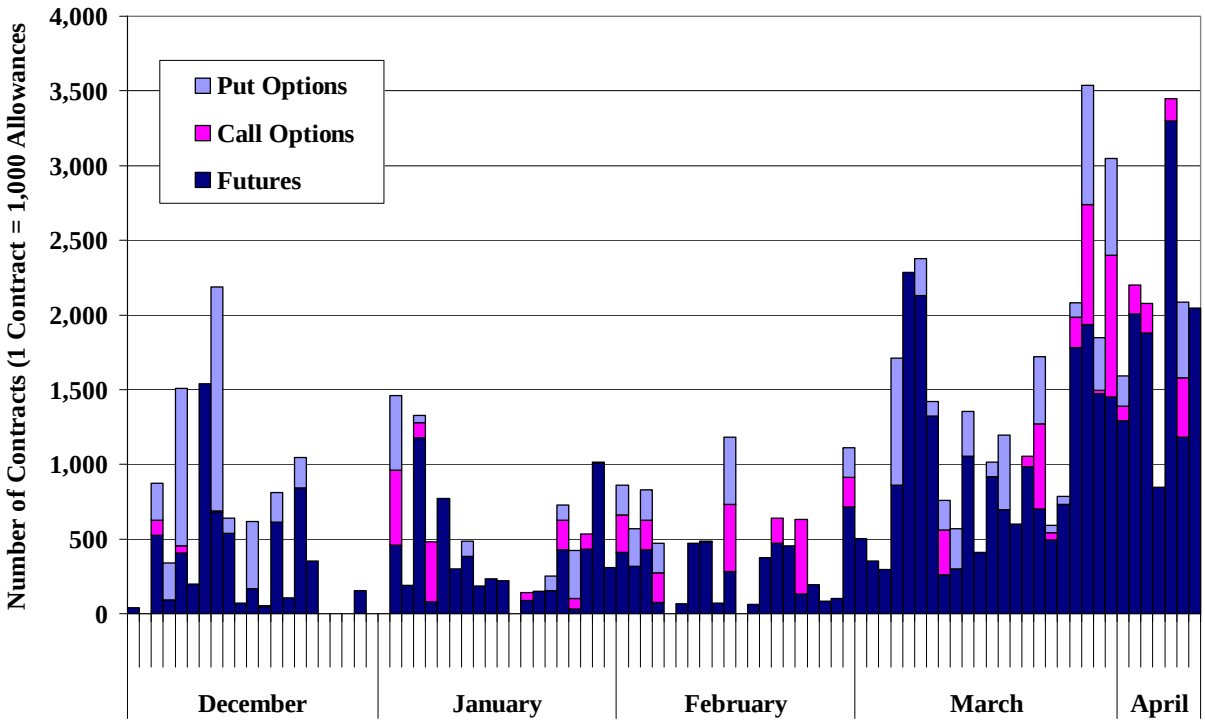
Conversely, when call option prices and put option prices move in the same direction, it signals a change in the expected volatility of the underlying commodity price. For example, put and call prices spiked shortly before the auction December 17, 2008, suggesting there was considerable uncertainty regarding the outcome.

D. VOLUMES AND OPEN INTEREST

The three figures in this section summarize the volume of trading and the open interest in exchange-traded futures and options. Open interest is the amount of futures or options contracts that have been traded, but have not reached the time of delivery, expired, or been exercised. For example, if Firm A sells 100 contracts to Firm B, Firm A will have a short position of 100 contracts, Firm B will have a long position of 100 contracts, and the total open interest will be 100 contracts. Hence, the total open interest can be determined by summing across all of the long positions of market participants or by summing across all of the short positions.

Figure 3 shows the volume of trading on the CCFE each day for futures, call options, and put options.

Figure 3: Volume of Trading of CCFE Futures and Options
December 1, 2008 to April 9, 2009



Sources: Options volumes are available at "www.ccfe.com/mktdata_ccfe/optionsSummary.jsf?symbol=rggi" and futures volumes are available at "www.ccfe.com/mktdata_ccfe/futuresSummary.jsf?symbol=rggi".

The volume of trading significantly increased throughout the period, from an average daily amount of 303 futures contracts and 199 options contracts in December 2008 to 979 futures contracts and 363 options contracts in March 2009. The daily volume of trading increasing further in the early days of April, averaging 1,792 futures contracts and 250 options contracts on the days shown above. Although the volume of trading has risen considerably, the total volume of contracts traded in the first three months of 2009 (33 million) is still modest compared to the number of allowances auctioned in the same period (34 million).

The most liquid futures contract is the vintage 2009 contract for December 2009 delivery, accounting for 89 percent of the volume traded in the first quarter of 2009. During this period, the end of month contract (e.g., the January 2009 contract during January or the February 2009 contract during February) accounted for 7 percent of the volume, while other contracts accounted for the remaining 4 percent.

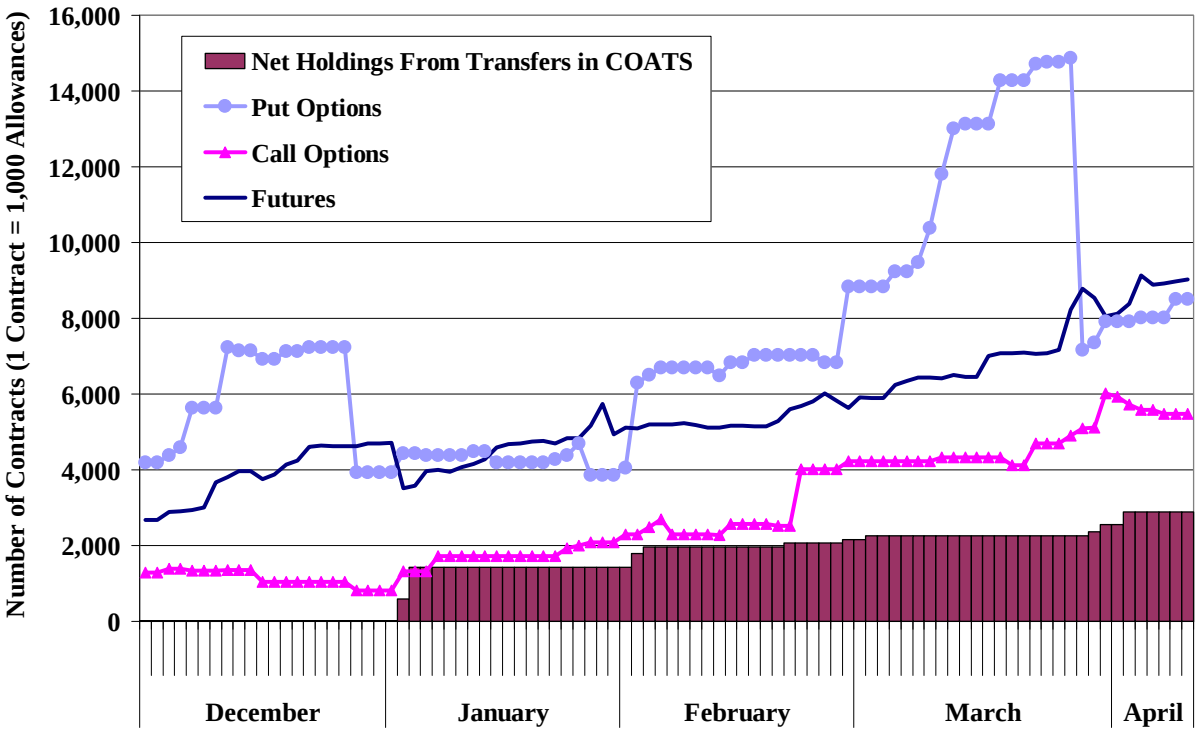
Of the options traded during the first quarter of 2009, 55 percent were put options and 43 percent were put options with a strike price of $3.00. This suggests that a substantial number of firms have sought protection in the event that RGGI allowance prices drop substantially below current levels. Trading of call options has been more varied with significant volumes trading for products with strike prices ranging from $4.00 to $6.00.

Figure 4 shows the open interest on each day for the future and options contracts shown in the previous figure. Figure 4 also shows the net change in allowance holdings of all firms in the COATS registry as a result of transactions between unaffiliated firms.[9] The net change in holdings is smaller than the gross volume of transactions between unaffiliated firms, because it nets sales against purchases for each firm. For example, if firm A transfers 100,000 allowances to Firm B but then Firm B transfers 20,000 allowances to Firm A, the figure would show a net change of 80,000 even though the volume of transfers would be 120,000. This is an important

[9] This excludes the majority of allowances, which are held by firms that purchased them directly in the auction, received them through allocations by one of the Participating States, or had them transferred from an affiliated firm.

distinction because the net change shown in Figure 4 was 2.9 million allowances while the gross volume was 4.2 million allowances.

Figure 4: Open Interest in CCFE Futures and Options
December 1, 2008 to April 9, 2009



Sources: Physical holdings of allowances are based on information in COATS, open interest in options is available at "www.ccfe.com/mktdata_ccfe/optionsSummary.jsf?symbol=rggi", and open interest in futures is available at "www.ccfe.com/mktdata_ccfe/futuresSummary.jsf?symbol=rggi".

The open interest shows that the positions of firms trading futures and options have been increasing over the period. The first significant decline in the open interest in futures resulted from the delivery of futures contracts with a delivery month of December 2008. On January 5 & 6, the delivery of these futures led to the first substantial rise in the allowance holdings registered in COATS as a result of trading. Then the delivery of the January futures contract (on February 3 & 4) and the delivery of the March futures contract (on April 2) account for most of the remainder. Otherwise, few allowance trades have been registered in COATS.

Although the total open interest in futures contracts declined following the delivery of the December 2008, January 2009, and March 2009 contracts, the total open interest increased from

2.7 million on December 1 to 9.0 million on April 9. 91 percent of the open interest on April 9 was for the benchmark contract, the vintage 2009 contract for December 2009 delivery.

The open interest in options generally increased until December 29 when a large number of put option contracts reached expiration, and then increased again until March 27 when another large number of put option contracts reached expiration. Most of the put option contracts reaching expiration on December 29 and March 27 had strike prices of $3.00 or $3.25. These outcomes suggest that some firms with long positions were seeking insurance against an unexpectedly low clearing price in the December 17 and March 18 auctions. The declines in open interest on the four other option expiration dates shown above were relatively small.[10]

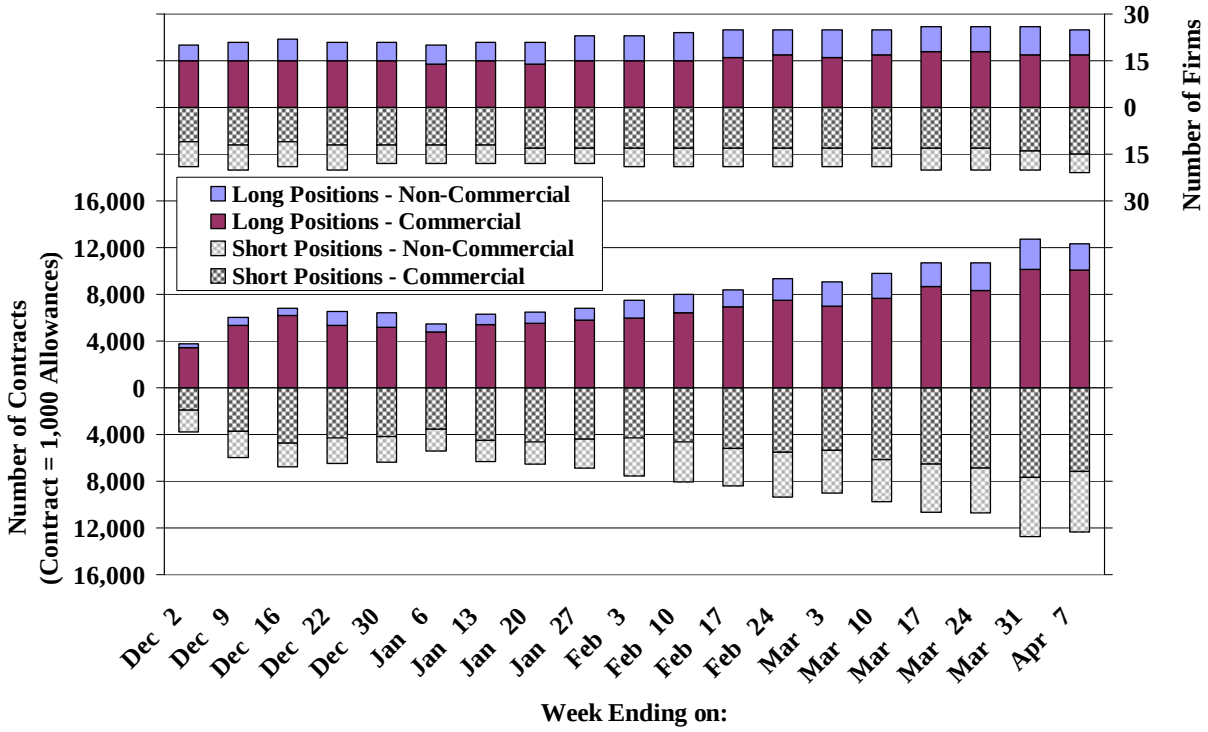
Figure 5 provides additional information about the firms trading CCFE futures and options from the weekly Commitment of Traders ("COT") reports, published by the Commodity Futures Trading Commission ("CFTC"). Each day, firms with an open interest of 25 contracts or more are required to report their positions to the CFTC. The CFTC categorizes each firm as Commercial if it engages in trading primarily to supply its own need for allowances or Non-Commercial if it trades for another purpose. Hence, compliance entities are generally designated as Commercial and non-compliance entities are generally designated as Non-Commercial. Each Tuesday, the CFTC publishes a summary of the long and short positions of participants in the market.

Figure 5 summarizes the long and short positions of Commercial and Non-Commercial firms on a weekly basis since the CFTC began to publish the COT reports. It shows the number of firms with long positions and the number firms with short positions. It also shows the aggregate size of all long positions and the aggregate size of all short positions. Since each contract has a buyer and a seller, the total open interest in the market is equal to the total of all long positions and it is equal to the total of all short positions. The total open interest implied by the amount of long and short positions in Figure 5 is smaller than the sum of open interest in futures and options in

[10] CCFE lists options with mid-month and end-month expiration. Options also expired on December 15, January 15, January 28, and February 25.

Figure 4, because some firms buy or sell options contracts that offset or have a discounted impact on their long or short positions.

Figure 5: Open Interest in the CCFE Futures and Options
December 2008 to April 2009



Source: The CFTC's Commitment of Traders reports which are available at "www.cftc.gov/marketreports/commitmentsoftraders/index.htm"

Since the CFTC began publishing COT reports for the CCFE's RGGI contracts, a substantial number of firms have been active in taking short and long positions (21 and 25 as of April 7). Commercial firms (i.e., compliance entities) account for the majority of long and short positions, although the positions held by Non-Commercial firms are also substantial. As of April 7, 82 percent of long positions and 58 percent of short positions were held by Commercial firms. The share of long positions held by Commercial firms is similar to the share of allowances purchased by compliance entities in the first three auctions (82 percent, 85 percent, and 78 percent, respectively). Non-Commercial firms have participated in the secondary market primarily by taking short positions. However, it is likely that many firms with short positions on the CCFE also hold physical allowances that were purchased in one of the auctions.

The preceding figures show that the volume of trading of standard futures and options contracts has continued to rise in the first quarter of 2009. As of April 7, the total open interest in exchange-traded futures and options contracts (on a combined basis) was approximately 12 million allowances and the net physical transfer of allowances from trading that has been registered in COATS is 2.9 million allowances. However, the total transfer of allowances from trading is still far lower than the 34 million allowances sold in the March 2009 auction.

E. Discussion of Market Monitoring

As the RGGI Market Monitor, we monitor trading in the secondary market in order to identify anticompetitive conduct. In any commodity market, one potential concern is that a firm could hoard a substantial share of the supply of a commodity to influence prices. At this stage, hoarding is not a significant concern for the RGGI allowance market because the amount of allowances in circulation and the open interest in allowance derivatives is small relative to the total supply of allowances. The total supply of allowances that will ultimately be available in the first compliance period (from 2009 to 2011) is more than 560 million. Given that only 88 million allowances are circulating in the secondary market[11] and the volume of trading in the secondary market has been modest thus far, it is not yet possible for the holdings of any participant to raise potential hoarding concerns.

Another potential competitive issue is that a firm expecting to purchase allowances in the auction might sell a large number of futures contracts in an effort to push the futures price below the competitive level. Such a firm might profit from buying a large number of allowances in the auction at a discount if the bidding in the auction were influenced by the depressed futures price. In a highly liquid market, this strategy would not be profitable because it would have a minimal effect on the futures price. Hence, it is encouraging that the volume of trading continues to grow and that the CFTC reports that a substantial number of firms have been taking short and long positions in RGGI futures and options contracts. However, we will continue to monitor for this concern.

[11] 78 million allowances have been dispersed in the first three auctions, and 10 million allowances have been allocated by the states.