RGGI Inc.

REPORT ON THE SECONDARY MARKET FOR RGGI CO_2 ALLOWANCES: FIRST QUARTER 2013

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 of Northeast and Mid-Atlantic states to reduce emissions of carbon dioxide (CO_2) from the power sector.

RGGI, Inc. is a non-profit corporation created to provide technical and administrative services to the states participating in the Regional Greenhouse Gas Initiative.

A. INTRODUCTION

The primary market for RGGI CO_2 allowances consists mainly of the auctions where allowances are initially sold. Once a CO_2 allowance is purchased in the primary market, it can then be resold in the secondary market. The secondary market for RGGI CO_2 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 CO_2 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 2013 and discusses the results of our market power screens. Several patterns have emerged in this period in the secondary market:

- *CO_2 Allowance Prices* – CO_2 allowance prices rose during the first quarter of 2013:
  - ✓ Hovering at approximately $2.00 in January and the first week of February;
  - ✓ Rising 25 percent in the week following the release of the Updated Model Rule on February 7;
  - ✓ Clearing at $2.80 in Auction 19 on March 13, consistent with prices in the secondary market at the time; and
  - ✓ Rising well above $3.00 in the final two weeks of March.
- *CO_2 Allowance Transfers* – The volume of CO_2 allowance transfers between unaffiliated firms was 5.83 million, an increase from 3.58 million allowances in the prior quarter. However, the volume was down from 38.7 million allowances in the first quarter of 2012 when transactions rose just before the compliance deadline for the first control period.
- *CO_2 Allowance Holdings* – The share of CO_2 allowances that were held by compliance entities and their affiliates after Auction 19 was 90 percent (out of approximately 200 million allowances in circulation).
- *Open Interest* – The open interest in RGGI futures increased from zero at the end of the prior quarter to 4.6 million at the end of first quarter of 2013, while open interest in RGGI options increased from 3 million at the end of the prior quarter to 5.3 million at the end of the first

quarter of 2013. The renewed interest in RGGI futures and option contracts reflects that some firms are taking steps to mitigate the risks from potential CO_2 allowance price fluctuations.

We evaluate information on the holdings of CO_2 allowances and allowance derivatives as well as the demand for allowances to identify firms that may have acquired a position that raises competitive concerns. In the current study period, we find no evidence of anticompetitive conduct.

B. BACKGROUND

The secondary market for RGGI CO_2 allowances comprises the trading of physical allowances and financial derivatives, such as futures, forward, and option 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"). Financial derivatives include any contracts whereby parties agree to exchange funds and/or allowances at some future date, depending in many cases on factors such as the price of allowances at some future date. Many financial derivatives eventually result in the transfer of physical CO_2 allowances (i.e., the transfer is registered in COATS), but this may occur months or years after the parties enter into a financial transaction. These include the following types of transactions:

- *Futures* – Under these contracts, two parties agree to exchange a fixed number of CO_2 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 CO_2 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 CO_2 allowance that is to be transferred. One standard futures contract equals 1,000 RGGI allowances.[1]
- *Forwards* – These are like futures contracts, but a forward contract typically requires that all financial settlement occur at expiration.
- *Call Options* – Call options give the purchaser the option to buy a fixed number of CO_2 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 December 2013 expiration date. If the price of the corresponding forward contract rose to $5.75, the firm could exercise the option to buy CO_2 allowances at $5 and immediately sell them at $5.75. Alternatively, if the price of the forward contract stayed

[1] More precisely, a futures contract requires parties with an open interest to post financial assurance in an account with the exchange until the contract reaches expiration. The exchange continually withdraws and deposits funds according to changes in the prices of the contracts in which the party has interest. For example, if a firm buys a contract for 1,000 allowances at $3.50/allowance, the purchasing firm (firm with a long position) must put $3,500 in an account (or whatever share of the entire liability the exchange requires). If the futures price declines to $3/allowance, the exchange transfers $500 from the account of a firm with a long position to the account of a firm with a short position (firm that sold a contract), and the firm with a long position is only required to keep $3,000 in the account. At the end of the delivery month, allowances are exchanged for funds according to the closing price on the last day of the month.

below $5, the firm would let the option expire without exercising it. One standard options contract can be exercised for 1,000 RGGI allowances.

- *Put Options* – Put options are similar to call options but they give the purchaser the option to *sell* a certain number of CO_2 allowances of a particular vintage year at a specified strike price any time prior to the expiration date.

Futures, forward, and option contracts allow firms to manage risks associated with unforeseen swings in commodity prices. Futures and forwards 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 and forwards, they usually require less financial security, making them more attractive to some firms.

The terms of futures, forward, and option contracts vary in the degree to which they are standardized. "Exchange-traded" contracts typically have the most standardized provisions, while the term "over-the-counter" ("OTC") is applied to contracts with less standardized provisions. However, OTC contracts, once entered into, are often settled through a clearinghouse in order to protect the parties from the risk that the counterparty defaults.

The amount of *open interest* is the net amount of futures, forwards, or options that have been traded for a contract with a particular set of specifications (i.e., vintage year, delivery month, etc.), but have not reached the time of delivery, expired, or been exercised. For example, if Firm A sells 100 contracts of a particular type 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 for the particular type of contract 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.

C. SUMMARY OF PRICES

This section summarizes prices in the secondary market for RGGI CO_2 allowances in the first quarter of 2013. Figure 1 shows transaction prices in the secondary market for CO_2 allowances, including the prices of allowance transfers registered in COATS[2] and the prices of futures contract trades on the Intercontinental Exchange ("ICE"). The figure also shows volume-weighted average prices in the first quarter of 2013 compared to the previous quarter and the first quarter of the previous year. This section also discusses the market prices for option contracts.

Key observations regarding RGGI CO_2 allowance prices:

- CO_2 allowance prices increased throughout the first quarter of 2013, ranging from $1.93 at the beginning of the quarter to a high of $3.42 at the end of the quarter. The most significant increases occurred in the second week of February following the release of the Updated Model Rule and in the final week of March.
- The clearing price in Auction 19 of $2.80 was 45 percent higher than the clearing price in Auction 18 (held in December 2012) and was consistent with the prices recorded for COATS transactions leading up to the auction.
- The prices of ICE futures trades ranged from $2.00 to $3.70 and rose in the same pattern as COATS transaction prices during the quarter.
- The strike prices of option contracts that were traded during the quarter were substantially higher than the strike prices of contracts that were traded in the previous quarter, consistent with the general rise in allowance prices.

Prices of CO_2 Allowances and Allowance Derivatives

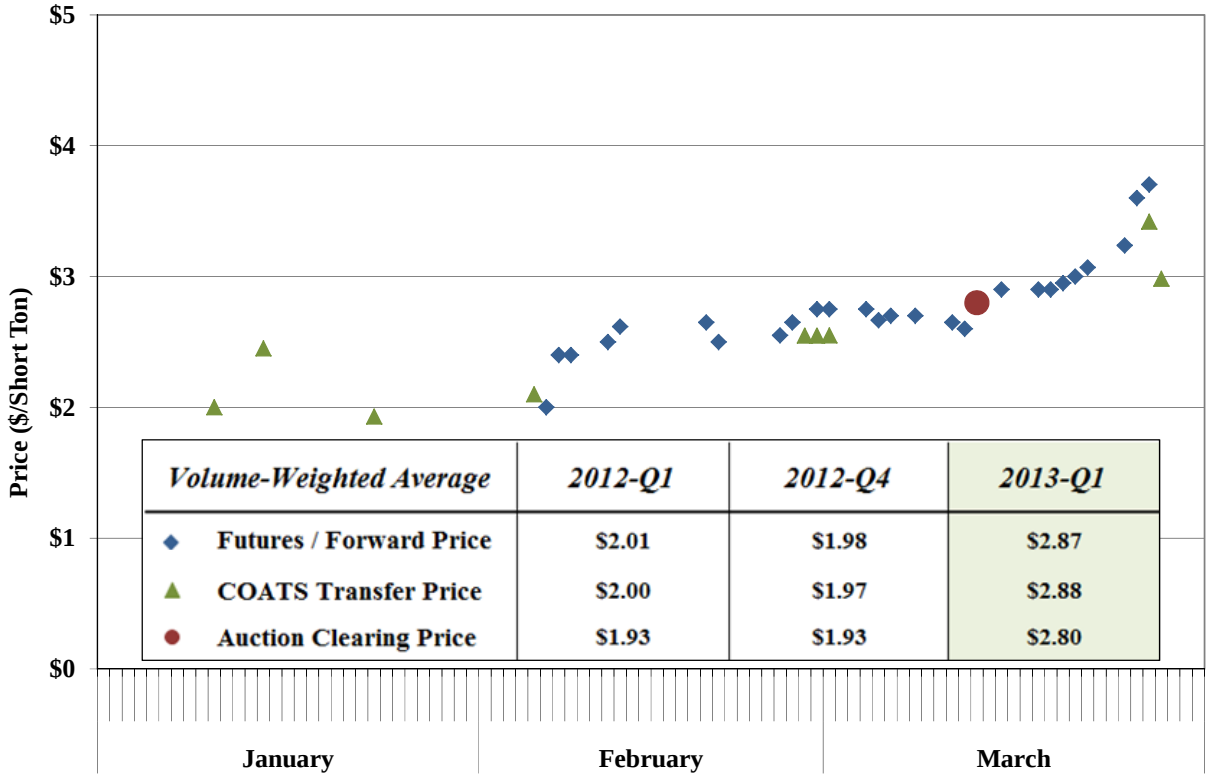
Figure 1 summarizes prices in the secondary market during the period. The blue diamonds show the prices of ICE futures trades on days with volume.[3] The green triangles show the volume-

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

[3] On October 16, 2012, ICE announced that, as a part of its efforts to implement Dodd-Frank regulations, it would convert existing positions in RGGI forward contracts to positions in futures contracts. See https://www.theice.com/S2F.jhtml for additional details. Since the settlement provisions of ICE's forward contracts had been similar to the settlement provisions of futures contracts, the impact of the switch was limited.

weighted average prices of physical deliveries registered in COATS on days with transactions when the price was recorded ("COATS transactions"). The red circle shows the clearing price of the CO_2 allowances that were sold in RGGI Auction 19, which was held on March 13. Figure 1 also shows volume-weighted average prices for each category in the first quarter of 2013 compared to the previous quarter and the first quarter of the previous year. Volume-weighted average prices for first and second control period CO_2 allowances are calculated together since the compliance deadline for the first control period has passed and all CO_2 allowances are essentially interchangeable for compliance purposes.

Figure 1: Prices in the Secondary Market for RGGI CO_2 Allowances[4,5]
January 1, 2013 to March 31, 2013



[4] Sources: Auction clearing prices are available at www.rggi.org/market/co2_auctions/results, ICE futures prices are available at www.theice.com, and the prices of physical deliveries are based on information in COATS.

[5] Volume-weighted average prices for 2012-Q1 include some futures trades on the Chicago Climate Futures Exchange ("CCFE"), where RGGI contracts were listed thru February 2012.

Key observations regarding CO_2 allowance prices:

- CO_2 allowance prices increased throughout the first quarter of 2013, ranging from a low of $1.93 to a high of $3.42 in COATS transactions. The average price of $2.88 was 46 percent higher than in the prior quarter and 44 percent higher than the first quarter of 2012.
- The clearing price in Auction 19 was $2.80, which was consistent with the prices recorded in COATS transactions leading up to the auction. The clearing price was 45 percent higher than in Auction 18 (held in December 2012) and 41 percent higher than the auction reserve price of $1.98. Auction 19 was the first auction to close above the reserve price since Auction 9 (held in June 2010), and led to an increase in the prices of forward contracts and COATS transactions in the weeks following the auction.
- The prices of ICE futures trades ranged from $2.00 to $3.70 and exhibited the same trends as COATS transaction prices during the quarter. The average price of $2.87 was 45 percent higher than in the prior quarter and 43 higher than in the first quarter of 2012.

Prices of Options for CO_2 Allowances

The clearing prices of option contracts 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 of the option, 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. 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.

Key observations regarding the pricing of options for CO_2 allowances in the first quarter of 2013:

- The strike prices of option contracts during the first quarter of 2013 ranged from $2.00 to $3.25, up from the prior quarter when strike prices ranged from $1.25 to $1.50.

D. VOLUMES AND OPEN INTEREST

This section evaluates the volume of COATS transactions (i.e., transfers of CO_2 allowances between unaffiliated parties as recorded in COATS) as well as the volume of trading and the level of open interest in exchange-traded futures and options. Figure 2 examines the volume of transactions recorded in COATS. Figure 3 summarizes the level of open interest in exchange-traded RGGI futures and option contracts.

Key observations regarding trading volumes and open interest in the first quarter of 2013:

- The volume of CO_2 allowance transfers in COATS between unaffiliated firms was 5.8 million, an increase from 3.6 million allowances in the prior quarter. However, volume was down from 38.7 million in the first quarter of 2012 when volumes were elevated in the weeks leading up to the compliance deadline for the first control period.
- The volume of trading of RGGI futures listed on ICE was approximately 12 million CO_2 allowances in the first quarter of 2013, an increase from just 154 thousand CO_2 allowances during the fourth quarter of 2012.
- The open interest in RGGI futures listed on ICE increased from zero at the beginning of the quarter to 4.6 million by the end of the first quarter of 2013.
- The open interest in RGGI options listed on ICE increased from 3 million at the end of the fourth quarter of 2012 to 5.3 million at the end of the first quarter of 2013.
- The share of CO_2 allowances that were held by compliance entities and their affiliates after Auction 19 was 90 percent (out of approximately 200 million allowances in circulation).

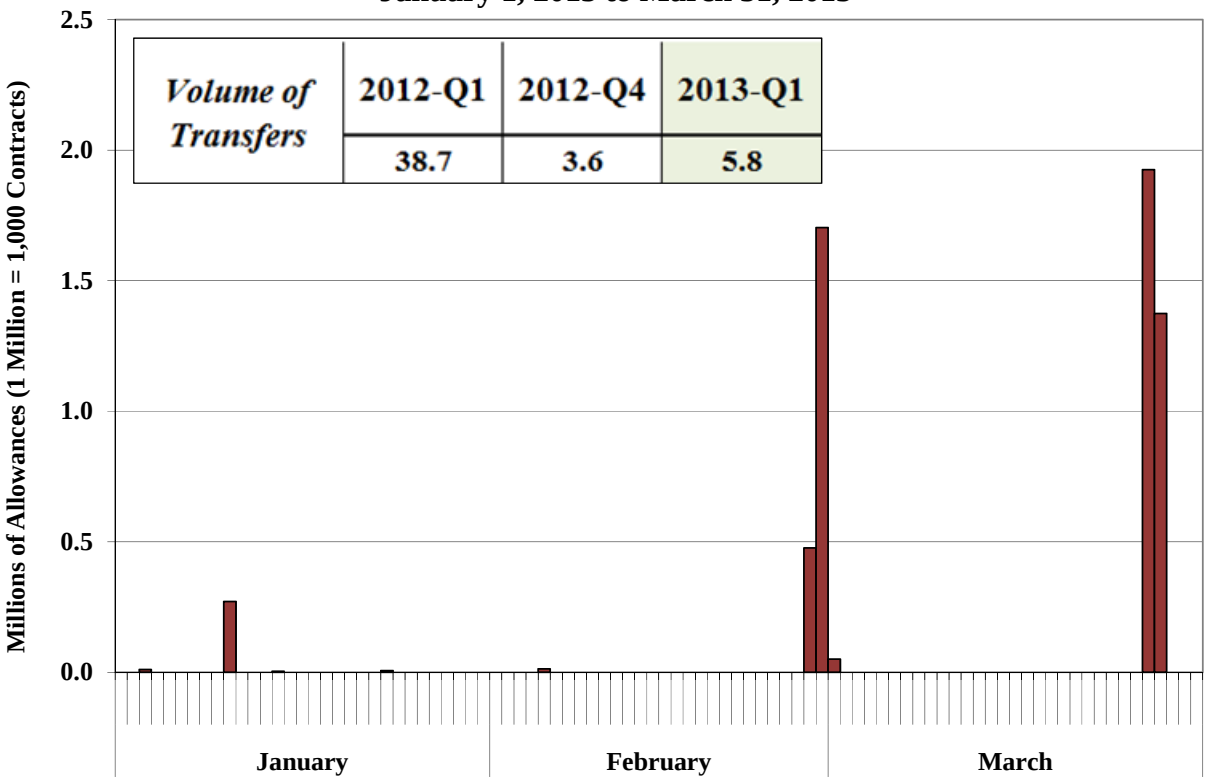
Volume of CO_2 Allowance Transfers, Futures, and Options

Figure 2 summarizes transfers of CO_2 allowances between the COATS accounts of unaffiliated firms during the first quarter of 2013. The figure also shows the volume of transfers in the first quarter of 2013 compared to the prior quarter and to the first quarter of 2012.[6] The volume of transfers of allowances for the first and second control periods are shown together because the

[6] Firms are categorized as affiliated based on available information. As a result, calculations provided in previous reports may be inconsistent with ones in this report when new information becomes available.

compliance deadline for the first control period has passed and all CO_2 allowances are essentially interchangeable for compliance purposes.

Figure 2: Volume of CO_2 Allowance Transfers Between Unaffiliated Parties[7]
January 1, 2013 to March 31, 2013



Key observations regarding the volume of transfers of CO_2 allowances in COATS between unaffiliated firms:

- The volume of CO_2 allowance transfers between unaffiliated firms was 5.8 million, an increase from 3.6 million allowances in the prior quarter, and a decrease from 38.7 million allowances transferred in the first quarter of 2012.
- Nearly 94 percent of the transfers were made in the last three trading days of February and March. Many of the transfers at the end of February and March resulted from the settlement of RGGI futures contracts.

[7] Source: CO_2 allowance transfers are based on information in COATS.

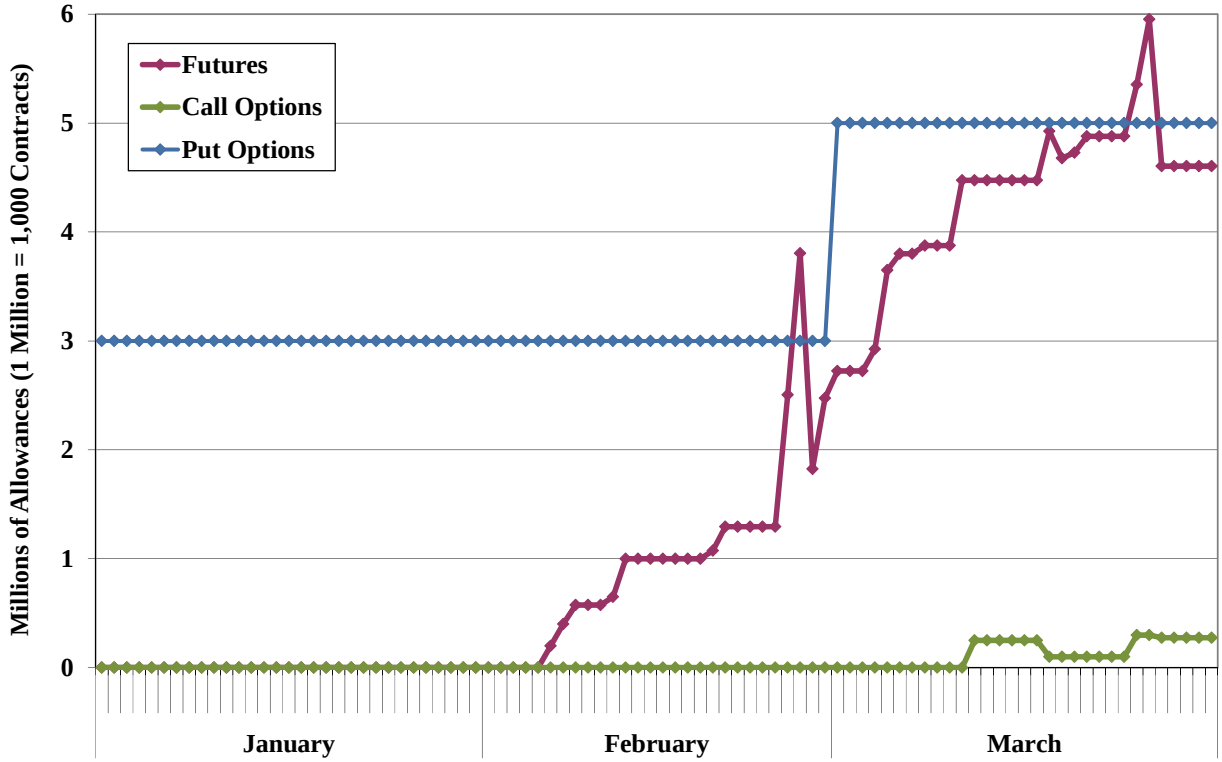
We also review patterns in the market for exchange-traded futures and options. Key observations regarding the volume of trading of RGGI futures and options contracts:

- The volume of trading of RGGI futures listed on ICE was approximately 12 million CO_2 allowances in the first quarter of 2013, an increase from 154 thousand CO_2 allowances during the fourth quarter of 2012.
- Approximately 53 percent of the volume of trading in RGGI futures took place in the last three trading days in February and March.
- Seven option trades were reported on ICE in the first quarter of 2013, an increase from three trades in the prior quarter. There were two options trades with an expiration date of March 2013, and five options trades with an expiration date of December 2013.
- The total volume of options trades in the first quarter of 2013 was 2.8 million, which was down slightly from 3 million in the fourth quarter of 2012.

Open Interest in Exchange-Traded RGGI Futures and Options

Figure 3 summarizes the level of open interest in exchange-traded futures and options listed on the ICE during the first quarter of 2013. The red line shows the level of open interest in futures contracts. As in Figure 2, the level of open interest in futures contracts for the first and second control period are shown together since all CO_2 allowances are essentially interchangeable for compliance purposes. The green line shows the level of open interest in call options. The blue line shows the level of open interest in put options.

Figure 3: Open Interest in RGGI Futures and Options
January 1, 2013 to March 31, 2013



Key observations regarding the level of open interest in RGGI futures and options:

- The open interest in RGGI futures had fallen to zero as a result of the settlement of December 2012 contracts and remained at zero throughout January. The first trade of the quarter was on February 6.
- Open interest in RGGI futures increased in the month leading up to Auction 19, reached a high of nearly 6 million on March 26, and ended the quarter at 4.6 million.
- The level of open interest in RGGI futures increased significantly in the last three trading days of February and March, which corresponds to a high volume of trading on those days. The decrease in open interest on February 27 and March 27 is due to the delivery of the current month contract at the end of those months.
- The open interest in RGGI put options increased from 3 million at the start of the quarter (as a result of three trades in December 2012) to 5 million at the end of the quarter.
- The open interest in RGGI call options increased from zero at the start of the quarter to 275k at the end of the quarter.

Commitments of Traders Reports

Additional information about the trading of futures, forwards, and options may be available in the weekly Commitments of Traders ("COT") reports, which are published by the Commodity Futures Trading Commission ("CFTC").[8] Participation in the market for RGGI CO_2 allowance derivatives remained low as the numbers of firms maintaining significant positions in each vintage listed on the ICE continued to be lower than 20 throughout the first quarter of 2013. The CFTC does not publish information from the COT reports for a particular vintage at times when fewer than 20 firms have reportable positions, so no specific information was published during the quarter.

[8] 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 frequently designated as Non-Commercial. Each Tuesday, the CFTC publishes the COT report, which is a summary of the long and short positions of participants in the market.

E. Discussion of Market Monitoring

As the RGGI Market Monitor, we monitor trading in the secondary CO_2 allowance market in order to identify anticompetitive conduct. Additionally, the Commodity Futures Trading Commission ("CFTC") evaluates trading in the secondary CO_2 allowance market consistent with its role as the regulator of derivative markets in the U.S. This section discusses two types of anti-competitive conduct for which we monitor. As in previous reports on the secondary market, we find no evidence of anti-competitive 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 or to prevent a competitor from obtaining CO_2 allowances. Hence, we screen information on the holdings of CO_2 allowances and allowance-derivatives and the demand for allowances to identify firms that might acquire a position that raises competitive concerns. During the first control period, hoarding was not a significant concern for the RGGI CO_2 allowance market because the amount of allowances that were available through the auctions was more than sufficient to satisfy the demand for allowances. During the second control period, which began in January 2012, the ability of an individual firm to hoard is limited by the substantial private bank of CO_2 allowances that has been accumulated and also by the market rules, particularly the auction rules that limit the amount of allowances that can be purchased by a single party or group of affiliated parties in a single offering to 25 percent.

Another potential concern is that a firm expecting to purchase CO_2 allowances in the auction might sell a large number of futures contracts in an effort to push the price of the contracts below the competitive level. Such a firm might profit from buying a large number of CO_2 allowances in the auction at a discount if the bidding in the auction were influenced by the depressed futures price. For this to be a profitable strategy, the firm would need to be able to substantially depress the futures price with a relatively small amount of sales—an amount smaller than the amount of CO_2 allowances it planned to buy in the auction. The best protection against this strategy is a market where other firms respond by making additional purchases. Firms that are looking for an

opportunity to reduce their short positions or to purchase CO_2 allowances for their future compliance needs help limit the effectiveness of a strategy to depress prices below the competitive level. Nevertheless, the CFTC has access to confidential transaction data, which allows it to monitor for evidence of manipulative conduct.