



**REPORT ON THE SECONDARY MARKET
FOR RGGI CO₂ ALLOWANCES: FOURTH QUARTER 2012**

Prepared for:

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

Prepared By:



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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 (CO₂) 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 CO₂ allowances consists mainly of the auctions where allowances are initially sold. Once a CO₂ allowance is purchased in the primary market, it can then be resold in the secondary market. The secondary market for RGGI CO₂ 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 CO₂ 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 fourth quarter of 2012 and discusses the results of our market power screens. Several patterns have emerged in this period in the secondary market:

- *CO₂ Allowance Prices* – CO₂ allowance prices were stable in the fourth quarter of 2012, ranging from \$1.93 to \$2.00. The prices in the secondary market were consistent with the clearing price of \$1.93 in Auction 18, which was held on December 5th.
- *CO₂ Allowance Transfers* – The volume of CO₂ allowance transfers between unaffiliated firms was 2.1 million, up from 0.7 million in the third quarter. Most of the fourth quarter volume resulted from the settlement of futures contracts at the end of December.
- *CO₂ Allowance Holdings* – The share of CO₂ allowances that were held by compliance entities and their affiliates was 94 percent at the end of the fourth quarter of 2012.

We evaluate information on the holdings of CO₂ allowances and allowance derivatives as well as the demand for allowances to identify firms that may have acquired a position that raises competitive concerns. We find no evidence of anticompetitive conduct; however, we will continue to evaluate the competitiveness of the market.

B. BACKGROUND

The secondary market for RGGI CO₂ 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 CO₂ 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 CO₂ 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 CO₂ 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 CO₂ 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 CO₂ 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 CO₂ 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 2012 expiration date. If the price of the corresponding forward contract rose to \$5.75, the firm could exercise the option to buy CO₂ allowances at \$5 and immediately sell them at \$5.75. Alternatively, if the price of the forward contract stayed below \$5, the firm would let the option expire without

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.

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 CO₂ 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 of the report summarizes prices in the secondary market for RGGI CO₂ allowances during the fourth quarter of 2012. Figure 1 shows the transaction prices in the secondary market for CO₂ allowances, including the prices of allowance transfers registered in COATS² and the prices of futures contract trades on the Intercontinental Exchange (“ICE”). The figure also shows volume-weighted average prices in the fourth quarter of 2012 compared to the previous quarter and to the fourth quarter of the previous year. This section also discusses the market for option contracts.

Key observations regarding RGGI CO₂ allowance prices:

- CO₂ allowance prices were stable in the fourth quarter of 2012, ranging from \$1.93 to \$2.00.
- The clearing price in Auction 18 of \$1.93 was consistent with the prices recorded for COATS transactions during the quarter.
- The prices of ICE futures trades were consistent with COATS transaction prices during the quarter.

Prices of CO₂ Allowances and Allowance Derivatives

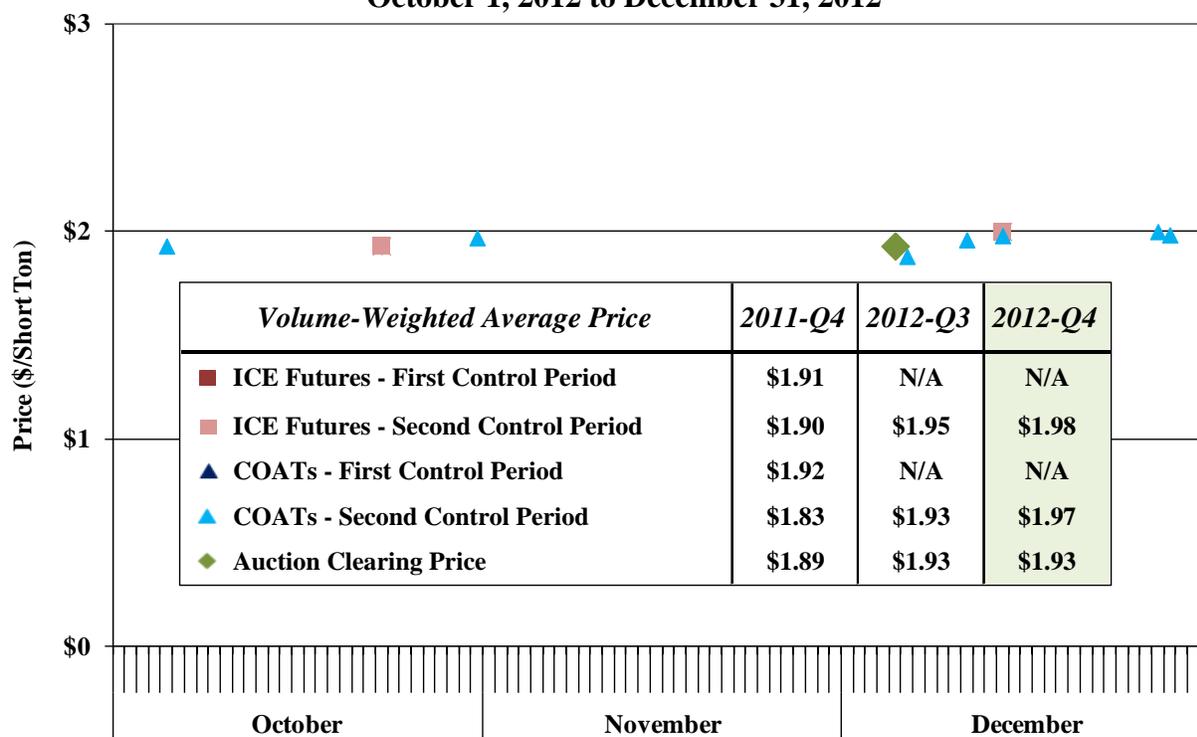
Figure 1 summarizes prices in the secondary market during the period. The red squares show the prices of ICE futures trades on days with volume.³ The blue triangles show the volume-weighted average prices of physical deliveries registered in COATS on days with transactions when the price was recorded (“COATS transactions”). The green diamond shows the clearing price of the CO₂ allowances that were sold in RGGI Auction 18, which was held on December 5. Figure 1

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.

also shows volume-weighted average prices for each category in the fourth quarter of 2012 compared to the previous quarter and the fourth quarter of the previous year. Volume-weighted average prices for first and second control period CO₂ allowances are calculated separately for the fourth quarter of 2011, since this was before the compliance deadline for the first control period (March 1, 2012). Following the compliance deadline for the first control period, first and second control period CO₂ allowances are essentially interchangeable for compliance purposes.

Figure 1: Prices in the Secondary Market for RGGI CO₂ Allowances^{4, 5, 6}
October 1, 2012 to December 31, 2012



Key observations regarding CO₂ allowance prices:

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 2011-Q4 include futures trades on the Chicago Climate Futures Exchange (“CCFE”), where RGGI contracts were listed until February 2012.

⁶ Following the compliance deadline for the first control period (March 1, 2012), allowances originally usable for the first control period are included in the averages for the second control period.

- CO₂ allowance prices were stable during the fourth quarter of 2012, ranging from a low of \$1.93 to a high of \$2.00 and averaging \$1.97 in COATS transactions.
- CO₂ allowance prices have increased since the fourth quarter of 2011 when the average price was \$1.83. The increase is consistent with the increase in the auction reserve price, which rose from \$1.89 in the 2011 auctions to \$1.93 in the 2012 auctions. The auction reserve price will rise to \$1.98 in Auction 19, which will be held in March 2013.
- The clearing price in Auction 18 of \$1.93 was consistent with the prices recorded for COATS transactions during the quarter.
- The prices of ICE futures trades were consistent with COATS transaction prices during the quarter.

Prices of Options for CO₂ 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 market for options for CO₂ allowances in the fourth quarter of 2012:

- Three option trades were reported on ICE in December, each for 1,000 put option contracts that will expire in December 2013 where one contract is for 1,000 CO₂ allowances. The strike prices of these contracts were \$1.25 or \$1.50.
- The low volume of options trading suggests that firms perceive little risk from variations in future CO₂ allowance prices. Since the auction reserve price is indexed to inflation, compliance entities are unlikely to be able to obtain CO₂ allowances at a lower price in the future. Prices in the secondary market have remained very close to the auction reserve price, suggesting that firms perceive little risk that CO₂ allowances will fall below this level.

D. VOLUMES AND OPEN INTEREST

This section evaluates the volume of COATS transactions (i.e., transfers of CO₂ allowances between unaffiliated parties as recorded in COATS) and the volume of trading and the open interest in exchange-traded futures and options. Figure 2 examines the volume of COATS transactions recorded in COATS.

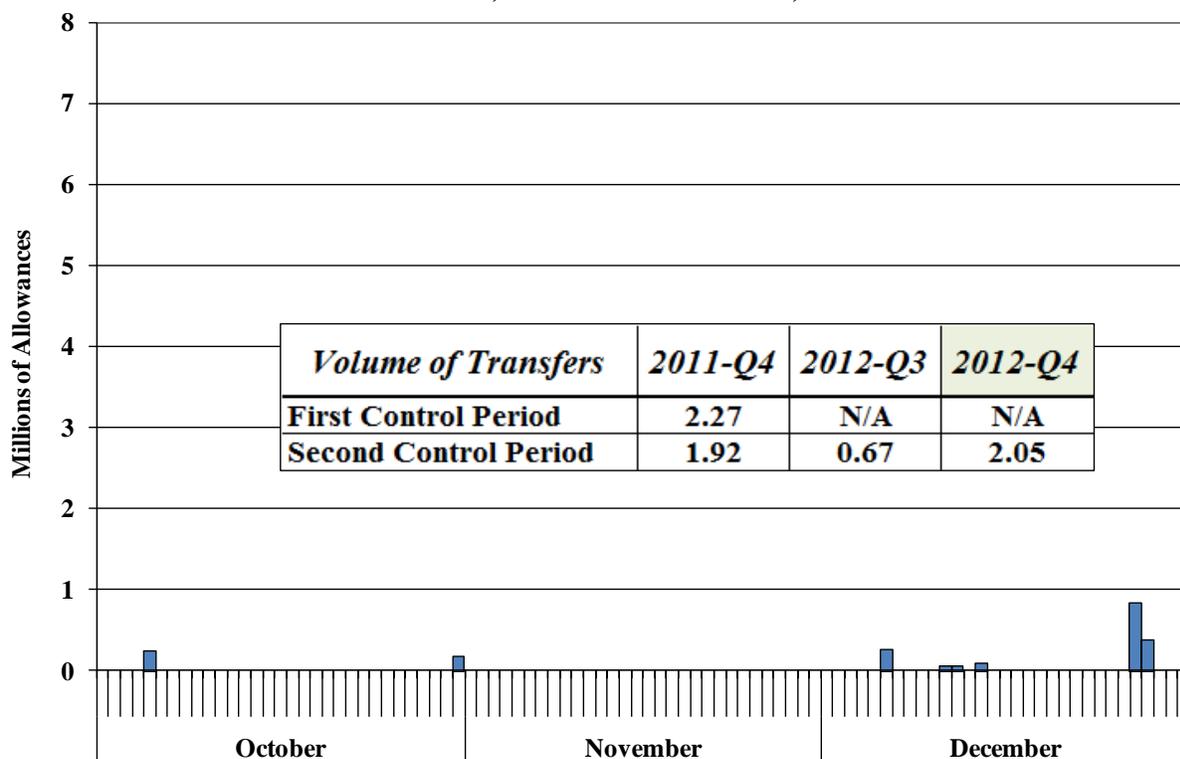
Key observations regarding trading volumes and open interest in the fourth quarter of 2012:

- The volume of CO₂ allowance transfers between unaffiliated firms increased to 2.1 million from 0.7 million allowances in the third quarter, although this was down from 4.4 million allowances in the fourth quarter of 2011.
- The volume of trading of RGGI futures listed on ICE remained low (154 thousand CO₂ allowances) during the fourth quarter of 2012.
- The open interest in RGGI futures listed on ICE rose to 1.2 million before falling to zero as a result of the settlement of December 2012 contracts at the end of the month.
- The open interest in RGGI options listed on ICE increased from zero at the end of the third quarter to 3 million at the end of the fourth quarter.
- The share of CO₂ allowances that were held by compliance entities and their affiliates was 94 percent at the end of the fourth quarter of 2012.

CO₂ Allowance Transfers Registered in COATS

Figure 2 summarizes transfers of CO₂ allowances between the COATS accounts of unaffiliated firms during the fourth quarter of 2012. The figure also shows the volume of transfers in the fourth quarter of 2012 compared to the prior quarter and to the third quarter of the previous year. The volume of transfers for first and second control period CO₂ allowances are shown separately for the fourth quarter of 2011, which was before the compliance deadline for the first control period.

**Figure 2: Volume of CO₂ Allowance Transfers Between Unaffiliated Parties^{7,8}
October 1, 2012 to December 31, 2012**



Key observations regarding the transfer of CO₂ allowances in COATS between unaffiliated firms:

- In the fourth quarter of 2012, approximately 2 million CO₂ allowances were transferred between unaffiliated firms. The majority of these CO₂ allowances were transferred at the end of December, likely as a result of the final settlement of December 2012 ICE futures contracts.
- The volume of CO₂ allowance transfers between unaffiliated firms increased from 0.7 million allowances in the prior quarter and decreased from 4.4 million allowances in the fourth quarter of 2011.
- First control period CO₂ allowances not used for first control period compliance are usable for compliance in any subsequent control period, making first and second control period allowances now essentially interchangeable for compliance purposes.

⁷ Source: CO₂ allowance transfers are based on information in COATS.

⁸ Following the compliance deadline for the first control period (March 1, 2012), allowances originally usable for the first control period are included in the averages for the second control period.

Volume and Open Interest in Futures and Options

Key observations regarding the volume of trading of futures and options contracts:

- The volume of futures trading on ICE was for 154 thousand CO₂ allowances during the fourth quarter of 2012, an increase from 25 thousand in the third quarter.
- The open interest in RGGI futures listed on ICE dropped from 1.2 million on December 26 to zero after the settlement of futures contracts with December 2012 delivery.
- The open interest in RGGI options listed on ICE increased from zero at the end of the third quarter to 3 million at the end of the fourth quarter. All of the open interest is for put options with strike prices between \$1.25 and \$1.50.

Commitments of Traders Reports

Additional information about the trading of futures, forwards, and options is available in the weekly Commitments of Traders (“COT”) reports, which are published by the Commodity Futures Trading Commission (“CFTC”).⁹ Participation in the market for RGGI CO₂ 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 fourth quarter of 2012. 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.

⁹ 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 CO₂ allowance market in order to identify anticompetitive conduct. Additionally, the Commodity Futures Trading Commission (“CFTC”) evaluates trading in the secondary CO₂ 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 CO₂ allowances. Hence, we screen information on the holdings of CO₂ 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 CO₂ 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 will be limited 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 CO₂ 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 CO₂ 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 CO₂ 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 CO₂ allowances for their future

compliance needs help limit the effectiveness of a strategy to depress prices below the competitive level. Given current price levels relative to the floor price for CO₂ allowances, firms would have a strong incentive to make additional purchases if a firm deliberately attempted to depress the futures price. Nevertheless, the CFTC has access to confidential transaction data, which allows it to monitor for evidence of manipulative conduct.