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**REGI Inc.**



**REPORT ON THE SECONDARY MARKET  
FOR REGI CO<sub>2</sub> ALLOWANCES: FOURTH QUARTER 2022**

**Prepared for:**

**REGI, Inc., on behalf of the REGI Participating States**

**Prepared By:**

**POTOMAC  
ECONOMICS**

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The Regional Greenhouse Gas Initiative (RGGI) was the first mandatory market-based regulatory initiative in the U.S. to reduce greenhouse gas emissions. The Regional Greenhouse Gas Initiative (RGGI) is a cooperative effort of Eastern states of the US to reduce emissions of carbon dioxide (CO<sub>2</sub>) 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 AND SUMMARY

The primary market for RGGI CO<sub>2</sub> allowances consists mainly of the auctions where allowances are initially sold. Once a CO<sub>2</sub> allowance is purchased in the primary market, it can then be resold in the secondary market. The secondary market for RGGI CO<sub>2</sub> 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<sub>2</sub> 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 2022 and discusses the results of our market power screens.

- Secondary Market Activity: Activity increased in the last quarter of 2022 leading up to and including the settlement of the benchmark (i.e., December) futures contract.
  - ✓ Physical allowance transfers between unaffiliated firms totaled 51 million, which was down 43 percent from the fourth quarter of 2021 and 82 percent higher than the third quarter of 2022.
  - ✓ The volume of trading of RGGI futures was 151 million CO<sub>2</sub> allowances in the fourth quarter of 2022, which was 163 percent higher than in the fourth quarter of 2021.
  - ✓ Open interest in RGGI futures and options decreased from 120 million allowances at the end of the previous quarter to 75 million allowances by the close of the fourth quarter of 2022.
- CO<sub>2</sub> Allowance Prices:
  - ✓ Prices generally ranged between \$13.00 and \$13.50 throughout the quarter, dipping just below \$13.00 in mid-October.
  - ✓ Auction 58 took place on December 7<sup>th</sup> and cleared at \$12.99, nearly \$1.00 below the CCR Trigger Price of \$13.91 and consistent with prices in the secondary market at the time.
- CO<sub>2</sub> Allowance Holdings – At the end of the fourth quarter of 2022:
  - ✓ There were 231 million CO<sub>2</sub> allowances in circulation.
  - ✓ Compliance-oriented entities held approximately 143 million of the allowances in circulation (62 percent).

- ✓ Approximately 148 million of the allowances in circulation (64 percent) are believed to be held for compliance purposes.

We evaluate information on the holdings of CO<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> allowances must be physically transferred to the buyer's account in the COATS registry and funds must be transferred to the seller. Allowances transferred must be usable for compliance in the vintage year of the futures contract. One standard futures contract equals 1,000 RGGI allowances.<sup>1</sup> These contracts are listed by an exchange with simple standardized terms to promote liquidity.
- *Forwards* – These are like futures contracts, but a forward contract typically requires that all financial settlement occur at expiration. These contracts can be made off an exchange between two parties, allowing the parties to agree to less standardized terms.
- *Call Options* – Call options give the purchaser the option to buy a fixed number of CO<sub>2</sub> allowances of a certain vintage year at a particular strike price at the expiration date. For example, suppose a firm holds a call option with \$5.00 strike price, and December 2022 expiration date. If the price of the corresponding forward contract rose to \$5.75, the firm could exercise the option to buy CO<sub>2</sub> allowances at \$5.00 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 exercising it. One standard options contract can be exercised for 1,000

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<sup>1</sup> 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.

RGGI allowances. Currently, call option contracts listed on both ICE and Nodal Exchange are European style, meaning that they cannot be exercised before the expiration date.

- *Put Options* – Put options are similar to call options but they give the purchaser the option to *sell* a certain number of CO<sub>2</sub> allowances of a particular vintage year at a specified strike price any time prior to the expiration date. Currently, put option contracts listed on both ICE and Nodal Exchange are European style, meaning that they cannot be exercised before 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 forward contracts, they generally require less financial security since they do not obligate the holder to exercise the contract if its value declines, which could make 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.

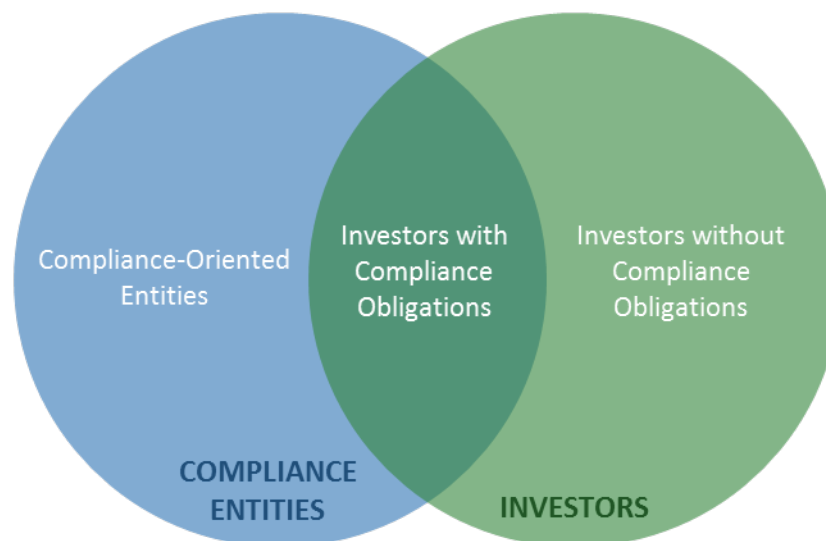
The volatility of a CO<sub>2</sub> allowance refers to the expected standard deviation of the distribution of allowance prices one year in the future. For example, if the expected value of the price one year

in the future is \$1 and the option-implied volatility is 25 percent, this implies that the probability that the price will be within 25 percent of \$1.00 (i.e., between \$0.75 and \$1.25) is 68.2 percent assuming that the price is distributed log-normally. Option-implied volatility refers to volatility estimates that are derived by analyzing the price and other terms of an option contract compared with the price of CO<sub>2</sub> allowances.

### *Categories of Firms Participating in the RGGI Market*

Participation in the RGGI market involves many different firms with various interests in RGGI allowances. Some participate in order to satisfy compliance obligations, others have investment interests, and still others participate for both purposes. To more effectively track the activity of different participants, we use several classifications for participant firms. Figure 1 summarizes the relationship between these classifications.

**Figure 1: Classifications of Participant Firms in the RGGI Marketplace**



- *Compliance-oriented entities* are compliance entities that appear to acquire and hold allowances primarily to satisfy their compliance obligations.
- *Investors with Compliance Obligations* are firms that have compliance obligations, but which hold a number of allowances that exceeds their estimated compliance obligations by a margin suggesting they also buy for re-sale or some other investment purpose. These firms often transfer significant quantities of allowances to unaffiliated firms.
- *Investors without Compliance Obligations* are firms without any compliance obligations.

These three categories form the basis for two overlapping groups.

- *Compliance Entities* – All firms with compliance obligations, and their affiliates.<sup>2</sup> Combines the first and second of the above categories.
- *Investors* – All firms which are assessed to be purchasing primarily for investment rather than compliance purposes. Combines the second and third of the above categories.

The assessment of whether a compliance entity holds a number of allowances that exceeds its compliance obligations by a margin that suggests they are also buying for re-sale or some other investment purpose is based on: (a) the entity’s forecasted share of the total compliance obligations for the entire RGGI footprint through 2026, (b) the total number of allowances in circulation, and (c) consideration of the pattern of the entity’s allowance transfers to unaffiliated firms versus affiliated firms. Since the designation of a compliance entity as an investor is based on a review of its transactions and holdings, the designation of a particular firm may change over time as more information becomes available. Therefore, some of the quantities in this report may not match previous reports because of changes in the classification of particular firms.

The number of allowances that are believed to be held for compliance purposes includes 100 percent of the allowances held by compliance-oriented entities and a portion of allowances held by other compliance entities (i.e., entities with compliance obligations that are not included in the compliance-oriented category).

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<sup>2</sup> Affiliates are firms that: (i) have a parent-subsidiary relationship with a compliance entity, (ii) are subsidiaries of a parent company that has a large interest in a compliance entity, (iii) have substantial control over the operation of a budget source and/or responsibility for acquiring RGGI allowances to satisfy its compliance obligations.



### **C. SUMMARY OF PRICES**

This section summarizes prices in the secondary market for RGGI CO<sub>2</sub> allowances in the fourth quarter of 2022. Figure 2 summarizes transaction prices in the secondary market for CO<sub>2</sub> allowances, including the prices of allowance transfers registered in COATS<sup>3</sup> and the prices of futures contract trades on the Intercontinental Exchange (“ICE”) and on the Nodal Exchange (“NEX”). Figure 3 analyzes the trading of options for RGGI allowance futures which firms use to hedge exposure to fluctuations in allowance prices.

Key observations regarding RGGI CO<sub>2</sub> allowance prices:

- Prices remained well below the Cost Containment Reserve (“CCR”) Trigger Price for 2022 of \$13.91 during the quarter, ranging mostly between \$13.00 and \$13.50. Prices of COATS transfers were generally consistent with futures prices during the quarter.
- The clearing price in Auction 58 (on December 7) settled at \$12.99/ton. This was consistent with secondary market prices at the time.

#### ***Prices of CO<sub>2</sub> Allowances and Allowance Derivatives***

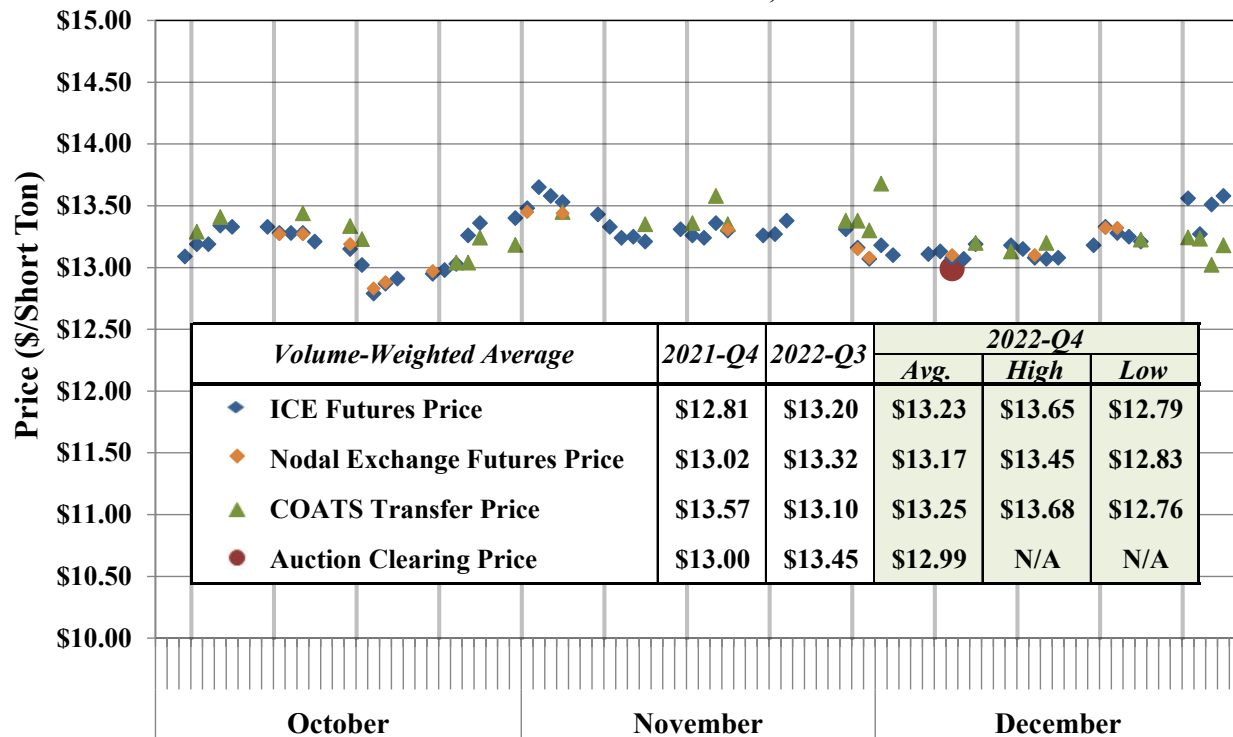
Figure 2 summarizes prices in the secondary market during the period. The blue diamonds show the price of futures trades on ICE, and orange diamonds show futures trades on Nodal Exchange on days with trading volume. The green triangles show the volume-weighted average prices of physical deliveries registered in COATS on days with transactions when the price was recorded (“COATS transactions”). The red circle shows the clearing price of the CO<sub>2</sub> allowances that were sold in RGGI Auction 58, which was held on December 7. Figure 2 also shows volume-weighted average prices for each category in the fourth quarter of 2022 compared to the previous quarter and the fourth quarter of the previous year.<sup>4</sup> CO<sub>2</sub> allowances that are usable for compliance in the fifth control period are shown.

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

<sup>4</sup> Sources: Auction clearing prices are available [here](#), ICE futures prices are available [here](#), NEX futures prices are available [here](#), and the prices of physical deliveries are based on information in COATS. Futures prices are shown for the prompt month contract settlement price even if the volume traded was for another contract.

Figure 2: Prices in the Secondary Market for RGGI CO<sub>2</sub> Allowances  
October 1 to December 31, 2022



Key observations regarding CO<sub>2</sub> allowance prices:

- Prices ranged between \$13.00 and \$13.50 during the quarter, dipping just below \$13.00 in mid-October. Prices of COATS transfers were generally consistent with futures prices throughout the quarter, although they exhibited larger differences in the final week of the quarter when futures prices were closer to \$13.50 and COATS prices were less than \$13.25.
- The clearing price in Auction 58 (on December 7) was \$12.99/ton, which was consistent with secondary market prices in the days leading up to the auction. In Auction 58, the clearing price was significantly below the CCR Trigger Price of \$13.91.

### Prices of Options for CO<sub>2</sub> Allowances

The clearing prices of option contracts provide insight about how the market expects the price of the underlying commodity to move in the future. 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

Average COATS Transfer Prices for previous quarters have been updated to reflect transactions reported after the compilation of data for previous quarterly reports.

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<sub>2</sub> allowances:

- Two option trades were recorded on ICE in the fourth quarter, which was down from ten in the previous quarter.
- One call and one put were traded with strike prices of \$13.00 and \$15.00 for settlement in December 2022. Less option trading coincided with more stable allowance prices.

### *Volatility of CO<sub>2</sub> Allowance Prices*

Market-based emissions reduction initiatives such as RGGI are designed to give firms efficient incentives to reduce or offset emissions. In the short-term, high-emitting generators will operate less frequently in favor of low-emitting generators. In the long-term, the market will affect the decisions of firms to develop offset projects, retire older inefficient generation, and perform maintenance that increases fuel efficiency and lowers carbon-intensity. Predictable CO<sub>2</sub> allowance prices decrease the risks associated with making long-term investments in reducing CO<sub>2</sub> emissions. Since CO<sub>2</sub> allowance prices can be volatile, the availability of futures and options contracts allows firms to protect themselves from the risks of such investments.

Expected price volatility is affected by elements of RGGI that promote allowance price stability. Potential upward price movements are limited by the Cost Containment Reserve (“CCR”), which allows for the sale of a fixed number of allowances in addition to the cap if the auction clearing price reaches the CCR Trigger Price.<sup>5</sup> Potential downward price movements are limited by the Reserve Price, which currently prevents allowances from being sold in the auction at a price

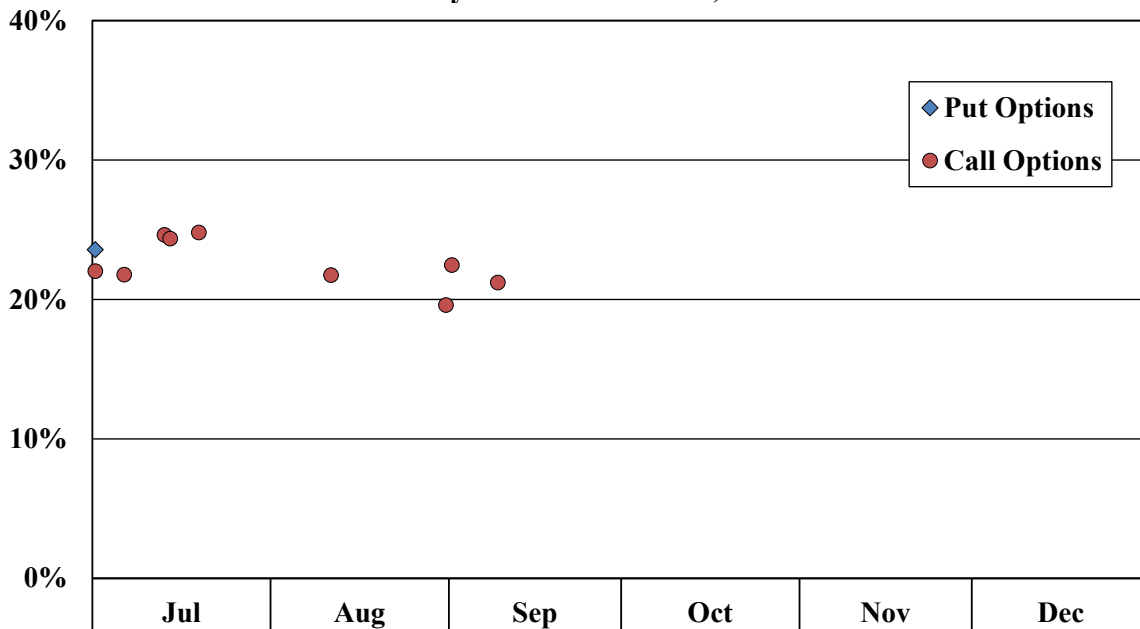
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<sup>5</sup> In 2022, the size of the CCR and the CCR Trigger Price were set in accordance with the 2017 Model Rule. The CCR Trigger Price was set at \$13.91 in 2022 and will rise 7 percent each year. Details are provided [here](#).

below \$2.44, and the Emissions Containment Reserve (“ECR”), which withholds allowances from circulation if prices fall below an established Trigger Price.<sup>6</sup>

One measure of the volatility of CO<sub>2</sub> allowance prices is known as option-implied volatility, which measures the volatility that is implied by the trading of option contracts for CO<sub>2</sub> allowances. If a firm perceives that CO<sub>2</sub> allowance prices are volatile, the firm may be willing to pay a high price for an option contract that protects it from unforeseen allowance price fluctuations. Likewise, if a firm perceives that CO<sub>2</sub> allowance prices are relatively stable, the firm will be willing to pay relatively little for the same option contract. Figure 3 shows the option-implied volatilities of option trades over the most recent six-month period.<sup>7</sup>

**Figure 3: Option-Implied Volatility of CO<sub>2</sub> Allowance Futures Prices  
July 1 to December 31, 2022**



<sup>6</sup> The ECR is set equal to 10 percent of the budgets of states implementing the ECR. Subsequently, the ECR Trigger Price is set at \$6.42 in 2022 and will rise 7 percent each year. Details are provided [here](#).

<sup>7</sup> Trades conducted within 90 days of a contract’s expiration are excluded from the option-implied volatility calculation. While options typically expire on the third Friday of the expiration month, the 15<sup>th</sup> is used as a proxy for the expiration date. For example, a transaction date of September 15 with an expiration of December 15 of the same year would be excluded.

Observations regarding the option-implied volatility of CO<sub>2</sub> allowance prices shown in Figure 3:

- Both options trades are not shown because they had expirations within 90 days of their transaction date. Option-implied volatility levels averaged 23 percent in the third quarter of 2022, which was down from 31 percent in the second quarter and reflected the general increase in allowance price stability.
- The Cost Containment Reserve with a Trigger Price of \$13.91/ton in 2022 has helped reduce the risk of upward price variations.

## **D. VOLUMES AND OPEN INTEREST**

This section evaluates the volume of COATS transactions (i.e., transfers of CO<sub>2</sub> 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 4 examines the volumes of transactions recorded in COATS and of futures trading. Figure 5 summarizes the level of open interest in exchange-traded RGGI futures and option contracts. Figure 6 evaluates the concentration of firms with open interest in exchange-traded RGGI futures and option contracts. Figures 7 and 8 show the levels of participation in the market for exchange-traded RGGI futures and option contracts by various categories of firms.

Key observations regarding trading volumes and open interest in the fourth quarter of 2022:

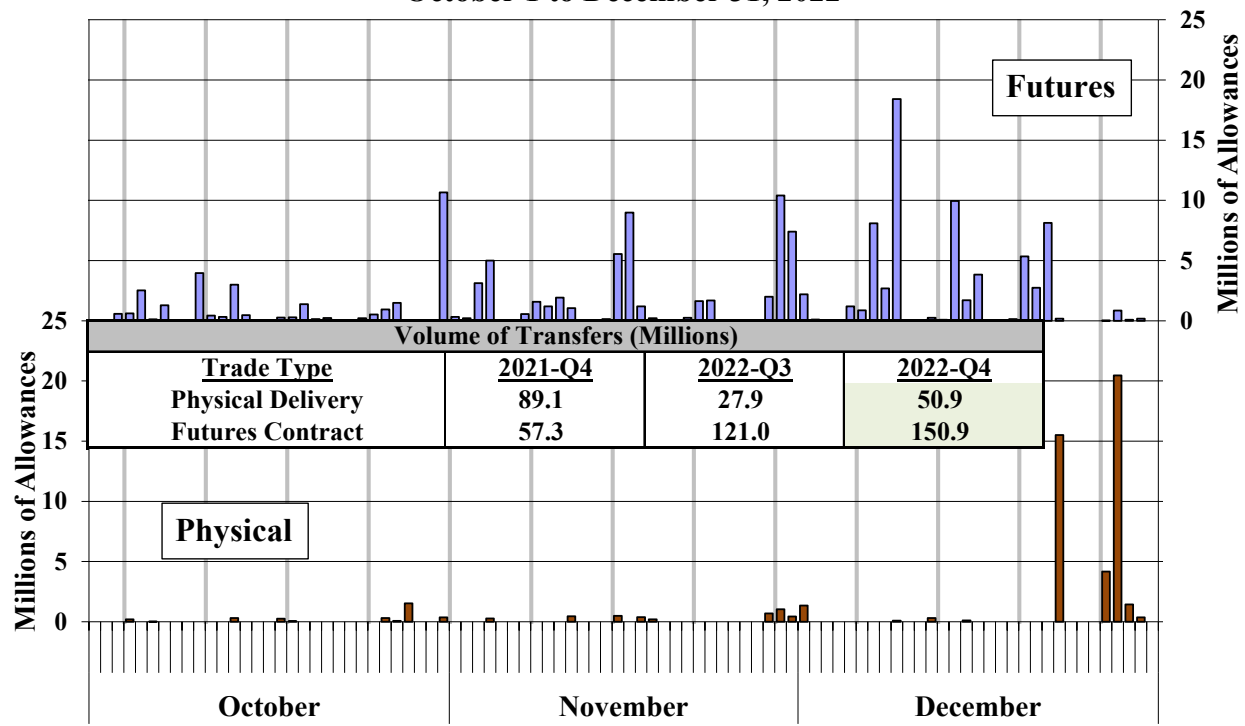
- Futures trading volume was 151 million CO<sub>2</sub> allowances in the fourth quarter of 2022, up from 121 million in the third quarter and up from 57 million in the fourth quarter of 2021.
- Physical allowance transfers between unaffiliated firms totaled 51 million, 82 percent higher than the third quarter of 2022 and 43 percent lower than the fourth quarter of 2021.
- Open interest in RGGI futures and options decreased from 120 million allowances at the end of the third quarter 2022 to 75 million by the close of the fourth quarter of 2022. Money managers and swap dealers continued to be active but shifted most positions to 2023 Vintage contracts before the end of the quarter.
- There were 231 million CO<sub>2</sub> allowances in circulation at the end of the quarter. Compliance-oriented entities held approximately 143 million of the allowances in circulation (62 percent). Approximately 148 million of the allowances in circulation (64 percent) are believed to be held for compliance purposes.

### ***Volume of CO<sub>2</sub> Allowance Transfers, Futures, and Options***

Figure 4 summarizes the volume of transfers of CO<sub>2</sub> allowances between the COATS accounts of unaffiliated firms and the volume of trading of RGGI futures listed on ICE and NEX.<sup>8</sup> The figure also shows the volume of transfers in the fourth quarter of 2022 compared to the previous quarter and to the fourth quarter of 2021.

<sup>8</sup> Firms are categorized as affiliated based on available information. As a result, calculations in previous reports may be inconsistent with this report if new information becomes available. Furthermore, the COATS transfer totals from previous quarters have been revised from previous reports to reflect late-reported transactions.

**Figure 4: Volume of CO<sub>2</sub> Allowance Transfers Between Unaffiliated Parties  
October 1 to December 31, 2022**



Key observations regarding physical CO<sub>2</sub> allowance transfers between unaffiliated firms:

- The volume of CO<sub>2</sub> allowance transfers between unaffiliated firms was 51 million, 82 percent higher than the third quarter and 43 percent lower than the fourth quarter of 2021.
- Most CO<sub>2</sub> allowance transfers occurred in the last few business days of the month when futures contracts settle, reflecting that most result from settlement of futures contracts. CO<sub>2</sub> allowance transfers were particularly high at the end of December when the benchmark (i.e., most liquid) contract settled.

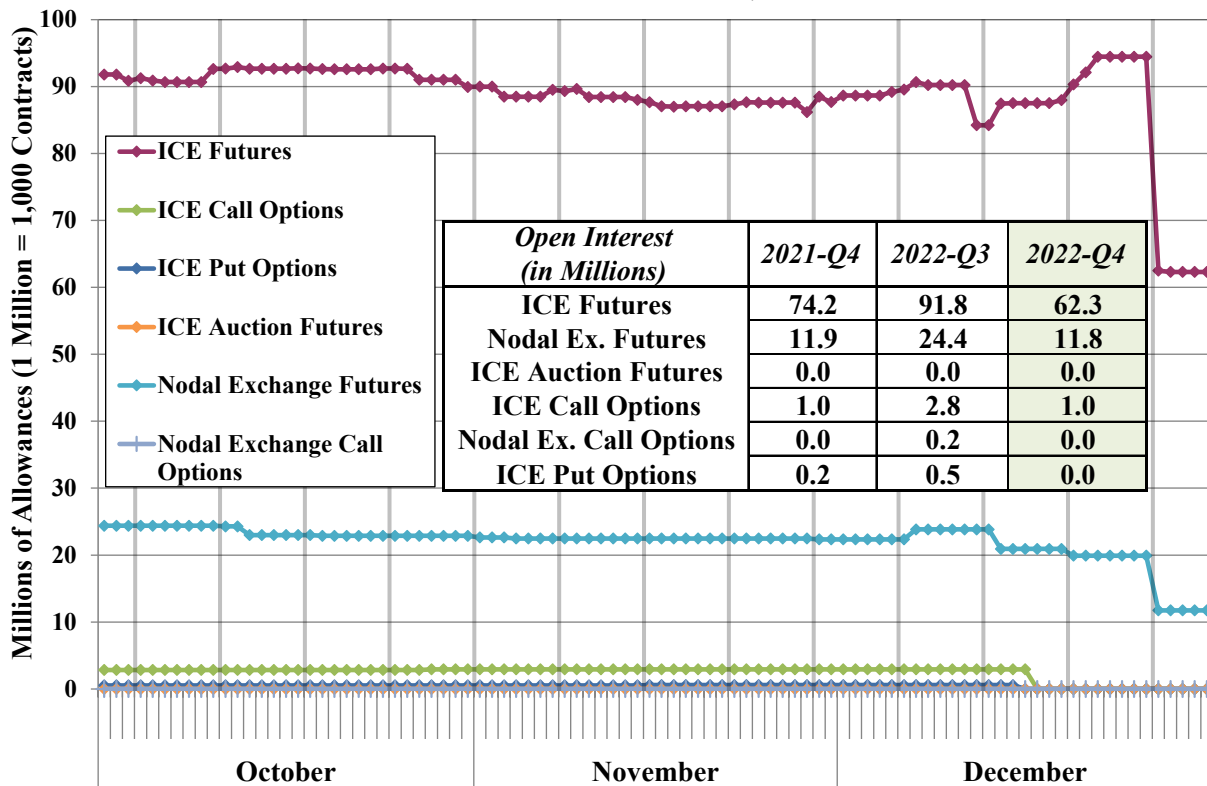
Key observations regarding the volume of trading of RGGI futures and options contracts:

- The total volume of RGGI futures trading was 151 million allowances in the fourth quarter of 2022, 25 percent higher than the third quarter trading volume, and 163 percent higher than the fourth quarter 2021 trading volume.
- Of futures trading volumes during the quarter, approximately 57 percent was for contracts that settle in December 2022 and 37 percent was for contracts that settle in December 2023. Much of the trading was by firms that were reducing their open interest in December 2022 contracts before settlement, while increasing their open interest in December 2023 contracts.

*Open Interest in Exchange-Traded RGGI Futures and Options*

Figure 5 summarizes the level of open interest in exchange-traded futures and options listed on ICE and Nodal Exchange during the fourth quarter of 2022. The red line shows the level of open interest in futures contracts on ICE. The teal line shows the level of open interest in futures contracts on NEX. The green line shows the level of open interest in call options on ICE. The blue line shows the level of open interest in put options on ICE. The orange line shows the level of open interest in auction futures<sup>9</sup> on ICE, while the purple line shows NEX call options.

**Figure 5: Open Interest in RGGI Futures and Options  
October 1 to December 31, 2022**



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

<sup>9</sup> RGGI Auction Futures are a product which converts to long or short RGGI futures contracts on the day of publication of the Market Monitor Report for a specific auction. Positions opened in the RGGI futures contract will be priced at the Auction Clearing Price as specified in the Market Monitor Report. The futures contract vintage will be the month and year in which the auction is held. For more information see [here](#).



- Open interest in RGGI futures on ICE decreased from 92 million allowances at the end of the third quarter of 2022 to 62 million by the close of the fourth quarter of 2022. Open interest in RGGI futures on Nodal Exchange decreased from 24 million between the close of the third quarter of 2022 to 12 million at the close of the fourth quarter of 2022.
- Open interest in RGGI put options on ICE fell to zero from 0.5 million, and open interest in call options on ICE also fell from 2.8 to 1.0 million. Open interest in call and put options on Nodal Exchange were both zero at the end of the quarter.

***Concentration of Open Interest***

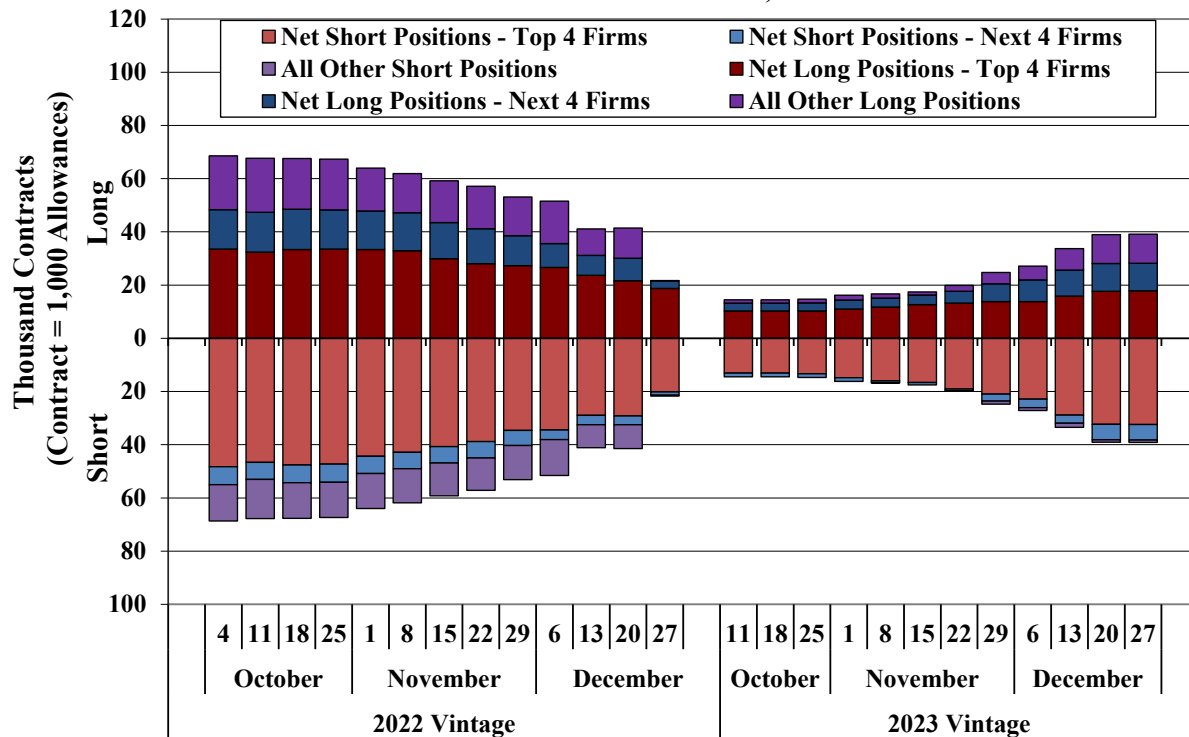
Additional information about the trading of futures, forwards, and options is available in the weekly Commitments of Traders (“COT”) reports, which are published by the Commodity Futures Trading Commission (“CFTC”)<sup>10</sup> for each week when greater than 20 firms have reportable positions in a particular product.

Figure 6 summarizes the concentration of open interest in 2022 and 2023 vintage ICE futures and options contracts reported during the quarter by the CFTC. The figure reports the net long positions in three categories: (i) the four firms with the largest long positions, (ii) the four firms with the largest long positions not including the Top 4, and (iii) all other long positions. The figure also reports the net short positions in three categories: (i) the four firms with the largest short positions, (ii) the four firms with the largest short positions not including the Top 4, and (iii) all other short positions.

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<sup>10</sup> Each day, firms with an open interest of 25 contracts or more must report their positions to the CFTC. Each Tuesday, the CFTC issues the COT report summarizing the long and short positions of market participants.

**Figure 6: Concentration of Open Interest in ICE Futures and Options  
October 1 to December 31, 2022**



Key observations regarding the concentration of open interest:

- A small number of firms (“Top Four” and “Next Four” combined) continue to account for a large share of the positions in ICE 2022 and 2023 Vintage contracts.
- Open interest in ICE 2022 Vintage contracts decreased steadily with each subsequent week in the quarter falling by 68 percent from the start of the quarter:
  - ✓ The “Top Four” Firms’ concentration rose as many firms exited Vintage 2022 futures positions before the end of December. The “Top Four” concentration in net long positions in ICE 2022 Vintage contracts rose from 49 percent at the beginning of October to a high of 86 percent at the end of December. The concentration in net short positions rose from 70 percent in the first week of October to 93 percent in the last week of December,
  - ✓ The “Next Four” largest short firms (excluding the “Top Four”) accounted for a relatively small amount (typically 10 percent) of net short open interest, indicating that some of these firms also hold long positions in ICE 2022 vintage contracts. For example, if a compliance entity with a long position for the prompt month does not have an immediate need to hold allowances, the firm may sell futures for the prompt month while buying futures for settlement in a month that is closer to the compliance deadline.

### *Participation in the Market for RGGI Derivatives*

Figure 7 summarizes the concentration of open interest by category of trader as defined by the CFTC: producers/merchants, swap dealers, money managers, spread, and other, which includes the CFTC's categories of "Other" and "Non-reportable." Producers/merchants represent the group of traders who use futures markets to hedge risks associated with their own production or 'handling' of RGGI allowances. This category most closely aligns with the compliance entity category used in this report but could potentially also include energy management companies that are not engaged directly with the generation of emissions but help others comply. A swap dealer is defined as an entity that deals primarily in swaps and may do so on the behalf of speculative traders or companies trying to reduce risk. In general, a money manager represents an entity that offers trading advice or manages futures trading for others. An investor without a compliance obligation would likely be classified as a money manager or potentially a swap dealer. In addition, if a trader has offsetting short and long positions, the associated quantity is included in a separate spread category. Finally, if a trader is not readily classified in a specific category, it is classified as "Other." The assignment of an entity to a CFTC category may change over time depending on changing activities of the entity or new information.

Figure 8 shows the number of traders by the same CFTC trader categories described above except "Spread" is included in "Other." At least four entities must be included in a category for CFTC to report the number of traders in a category. For that reason, a category may appear in Figure 7 for a particular vintage but be absent from Figure 8 if there are not at least four distinct traders in the category. The sum of the number of traders within the long and short categories will typically exceed the total number of traders since a single trader may have both long and short positions. For more refined descriptions of the CFTC classifications, see [www.cftc.gov](http://www.cftc.gov).

Figure 7: Concentration of Open Interest in ICE Futures and Options by Type  
October 1 to December 31, 2022

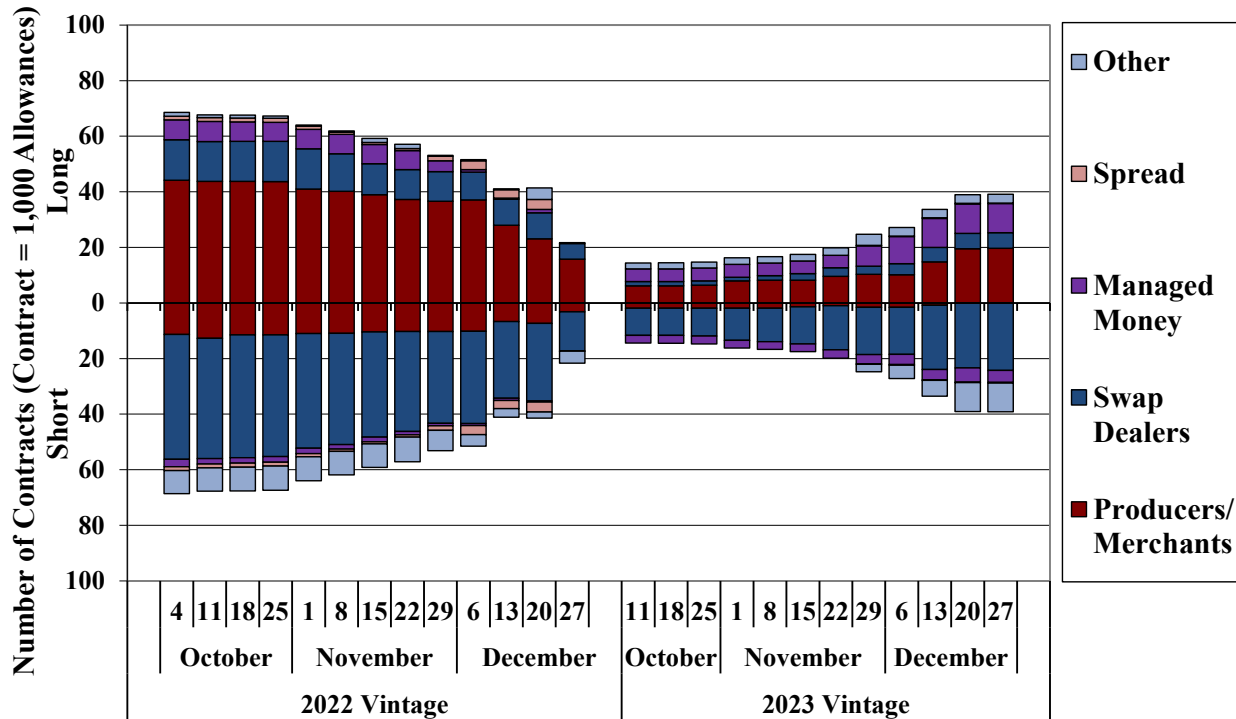
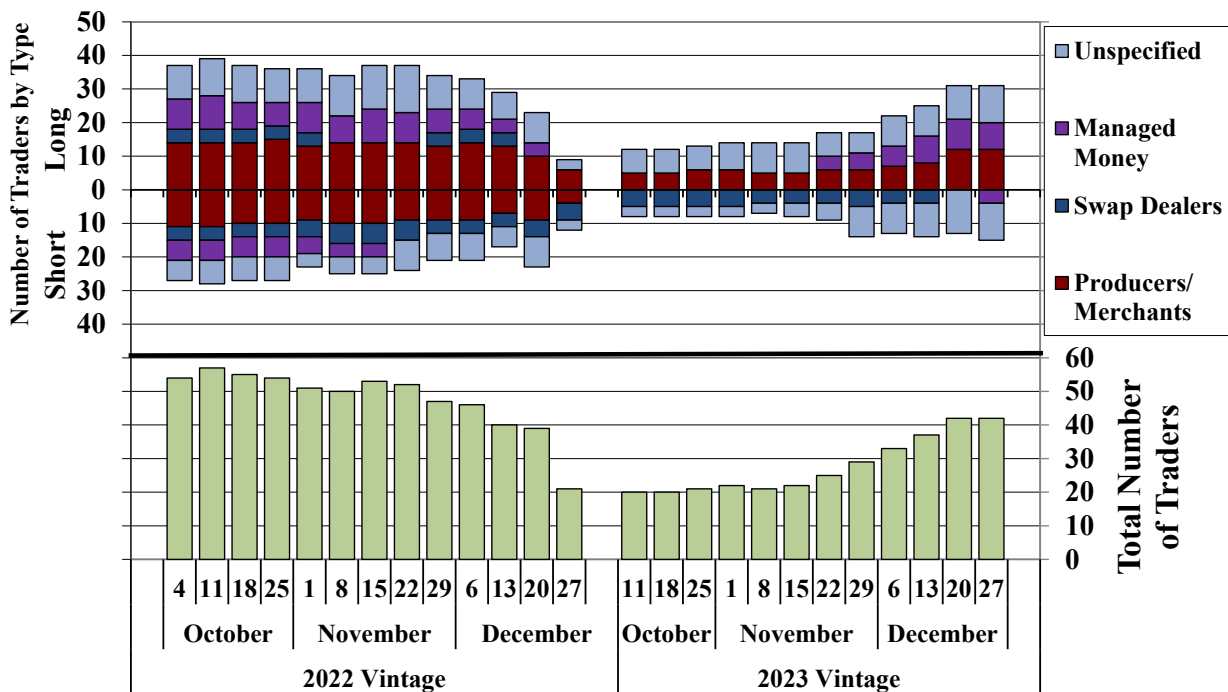


Figure 8: Number of Traders in ICE Futures and Options by Type  
October 1 to December 31, 2022



Key observations regarding the participation by various categories of firms:

- The open interest of 2023 Vintage contracts increased steadily from 14 million to 39 million by the end of the quarter, and the number of traders with reportable positions increased as well from 20 to 42 traders.
  - ✓ The “Top Four” Firms in combination with the next four firms (top eight) accounted for 92 percent of the long open interest at the beginning of the quarter. By the end of the quarter, their collective share falls to 72 percent, as money managers and swap dealers become more active in the latter part of the quarter. As was the case in the fourth quarter of 2021, while money managers increased long positions in the newest vintage contracts, Vintage 2023, they simultaneously reduced their long positions in the prior year vintage contracts.
- The concentration of ICE 2022 Vintage open interest long positions held by producers/merchants’ rose from 67 to 73 percent while investment-oriented categories – money managers and swap dealers – fell from 32 percent at the beginning of the quarter to 27 percent by the end of the quarter.
  - ✓ Producers/merchants’ increase in concentration occurred because of the general exit of all trader types but producers/merchants also reduced their positions in Vintage 2022 contracts significantly. Producers/merchants’ positions decreased by 28 million allowances, which still made up a relatively large proportion of the overall decrease in open interest of 47 million tons..
  - ✓ Swap dealers’ positions increased from 22 to 26 percent while managed money positions fell from 11 to 1 percent over the quarter. For some weeks in the quarter, there were fewer than four long swap traders, which is CFTC’s threshold for reporting the number of traders. Managed money traders had the largest number of traders among the non-merchant traders, varying between 4 to 10 over the quarter. Four managed money traders, the lowest of the quarter, were active in the last week of December.
  - ✓ An increase in spread positions occurred in the last weeks of December, doubling to 3.6 million tons from 1.3 in the first week of October. reaching a share of 11 percent of long positions by the end of the quarter
- The concentration of ICE 2022 Vintage open interest short positions held by swap dealers was large—76 percent or about 45 million allowances—at the start of the quarter, but rose further to 81 percent at the end of the quarter despite swap dealers’ open interest declining to 14 million allowances. Between 4 and 6 traders had reportable swap dealer short positions throughout the quarter.
- The CFTC does not publish firm-level information on open interest, although the information they publish provides an indication of the upper limits of the net long and net short positions of individual firms. Combined with firm-specific information about CO<sub>2</sub> allowance holdings from COATS, the information on open interest that is published by the CFTC is useful for

evaluating the potential for a firm to hoard RGGI CO<sub>2</sub> allowances, which is discussed further in Section E.

## E. DISCUSSION OF MARKET MONITORING

As the RGGI Market Monitor, we monitor trading in the secondary CO<sub>2</sub> allowance market in order to identify anticompetitive conduct. Additionally, the Commodity Futures Trading Commission (“CFTC”) evaluates trading in the secondary CO<sub>2</sub> 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<sub>2</sub> allowances. Hence, we screen information on the holdings of CO<sub>2</sub> allowances and allowance-derivatives and the demand for allowances to identify firms that might acquire a position that raises competitive concerns. The ability of an individual firm to hoard is limited by the substantial private bank of CO<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> 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.