
REGI Inc.



**REPORT ON THE SECONDARY MARKET
FOR REGI CO₂ ALLOWANCES: THIRD QUARTER 2021**

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 (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 AND SUMMARY

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 third quarter of 2021 and discusses the results of our market power screens.

- Secondary Market Activity:
 - ✓ Physical allowance transfers between unaffiliated firms totaled 8.1 million in the third quarter of 2021, which was down 44 percent from the second quarter but 24 percent higher than the third quarter of 2020.
 - ✓ The volume of trading of RGGI futures was 82.7 million CO₂ allowances in the third quarter of 2021, up 44 percent from the second quarter of 2021.
 - ✓ Secondary market activity increased significantly from the third quarter of 2020 when trading activity slowed during the pandemic.
 - ✓ Open interest in RGGI futures and options increased from 84.9 million allowances in the previous quarter to 114.9 million allowances by the close of the third quarter.
 - ✓ Increased futures trading and open interest from previous quarters has coincided with increasing participation of money managers and swap dealers in the futures market.
- CO₂ Allowance Prices:
 - ✓ Prices rose steadily from \$8.50/ton in early July to \$9.30/ton in mid-August, briefly dropped to \$8.75/ton, and then steadily rose to \$9.75/ton in the third week of September. In the last week of September, prices rose sharply to \$11/ton at the end of the month. The price increases have coincided with increased futures trading activity and increased participation by investors.
 - ✓ Auction 53 took place in early September and cleared at \$9.30/ton, which was consistent with secondary market prices during the same week.

- ✓ The strike prices for call options have ranged from \$8 and \$11/ton throughout the third quarter and option-implied price volatility has from the second quarter.
- *CO₂ Allowance Holdings* – At the end of the third quarter of 2021:
 - ✓ There were 166 million CO₂ allowances in circulation.
 - ✓ Compliance-oriented entities held approximately 66 million of the allowances in circulation (40 percent).
 - ✓ Approximately 75 million of the allowances in circulation (45 percent) are believed to be held for compliance purposes.

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. In the current study period, we find no evidence of anticompetitive conduct.

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. Allowances transferred must be usable for compliance in the vintage year of the futures contract. One standard futures contract equals 1,000 RGGI allowances.¹ 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 CO₂ 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 strike price, and December 2021 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 exercising it. One standard options contract can be exercised for 1,000

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.

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 CO₂ 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.

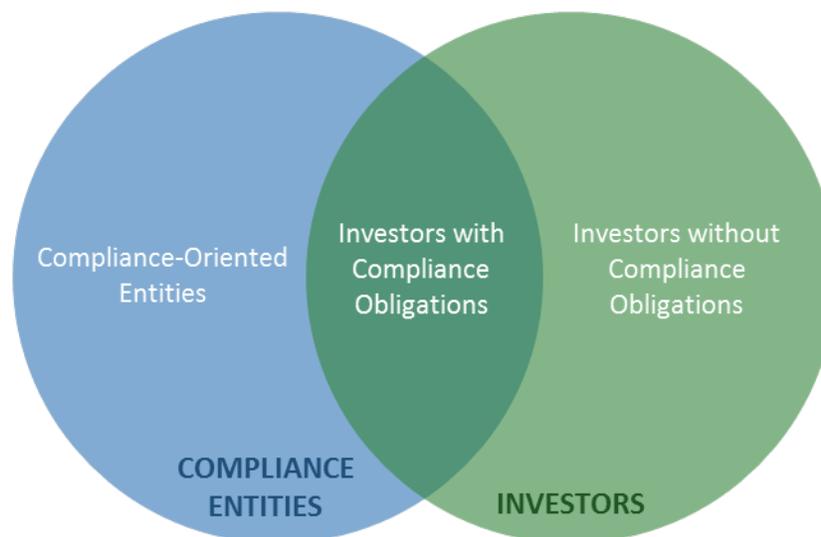
The volatility of a CO₂ allowance refers to the expected standard deviation of the distribution of allowance prices one year in the future. For example, if the expected value of the price one year

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 (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 CO₂ 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.² 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).

² 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 CO₂ allowances in the third quarter of 2021. Figure 2 summarizes transaction prices in the secondary market for CO₂ allowances, including the prices of allowance transfers registered in COATS³ and the prices of futures contract trades on the Intercontinental Exchange (“ICE”) and Nodal Exchange. 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 CO₂ allowance prices:

- Prices rose steadily from \$8.50/ton in early July to \$9.30 in mid-August, briefly dropped to \$8.75/ton, and rose steadily to \$9.75/ton in the third week of September. In the last week of September, prices rose steeply to \$11/ton at the end of the month. The price increases have coincided with increased futures trading activity and increased participation by investors.
- Prices of COATS transfers were generally consistent with futures prices during the quarter.
- The clearing price in Auction 53 (on September 8) was \$9.30. This was consistent with secondary market prices at the time.
- Twenty-one call options and two put options were traded with strike prices between \$8.00 and \$11.00. All of these trades were for settlement in December of 2021. Option trading patterns indicate that expectations of allowance price volatility increased in the third quarter but remained similar to the higher levels seen at the end of the second quarter.

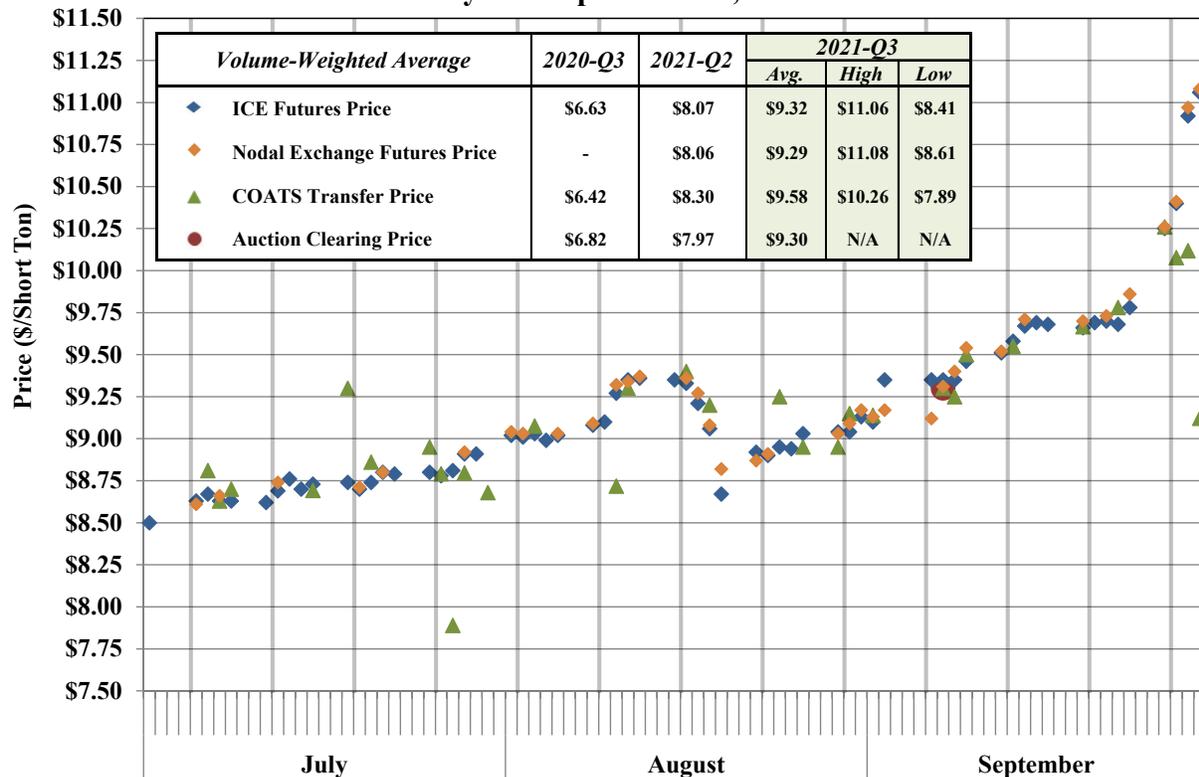
Prices of CO₂ Allowances and Allowance Derivatives

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 CO₂ allowances that were sold in RGGI Auction 53, which was held on September 8. Figure 2 also shows volume-weighted average prices for each category in the third quarter of 2021 compared to the previous

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

quarter and the third quarter of the previous year. Additionally, high and low values are presented for the daily volume-weighted average values. CO₂ allowances that are usable for compliance in the fifth control period are shown.

**Figure 2: Prices in the Secondary Market for RGGI CO₂ Allowances⁴
July 1 to September 30, 2021**



Key observations regarding CO₂ allowance prices:

- Prices rose steadily from \$8.50/ton in early July to \$9.30/ton in mid-August, briefly dropped to \$8.75/ton, and then continued a steady ascent to \$9.75/ton in the third week of September. In the last week of September, prices rose sharply and reached \$11/ton at the end of the month,
- Prices of COATS transfers were generally consistent with futures prices throughout the quarter with the exception of a few outliers, which in several instances were about \$0.75

⁴ Sources: Auction clearing prices are available [here](#), ICE futures prices are available [here](#), Nodal Exchange 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. Average COATS Transfer Prices for previous quarters have been updated to reflect transactions reported after the compilation of data for previous quarterly reports.

lower or \$0.50 higher than other transactions at the time. These instances can result when pricing terms are agreed to before the actual transaction.

- The clearing price in Auction 53 (September 8) was \$9.30, which was relatively consistent with secondary market prices in the days leading up to and immediately following the auction.

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 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 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 CO₂ allowances:

- Twenty-three option trades were recorded on ICE in the third quarter, which was up slightly from the previous quarter.
- Twenty-one call options and two put options were traded with strike prices between \$8.00 and \$11.00. All of these trades were for settlement in December of 2021. This activity suggests that market participants are seeking protection from the risk of upward movements in RGGI allowance prices.

Volatility of CO₂ 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 CO₂ allowance prices decrease the risks associated with making long-term investments in reducing CO₂ emissions. Since CO₂ 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.⁵ Potential downward price movements are limited by the Reserve Price, which currently prevents allowances from being sold in the auction at a price below \$2.38, and the Emissions Containment Reserve (“ECR”), which withholds allowances from circulation if prices fall below established trigger prices.⁶

One measure of the volatility of CO₂ allowance prices is known as option-implied volatility, which measures the volatility that is implied by the trading of option contracts for CO₂ allowances. If a firm perceives that CO₂ 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 CO₂ 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.

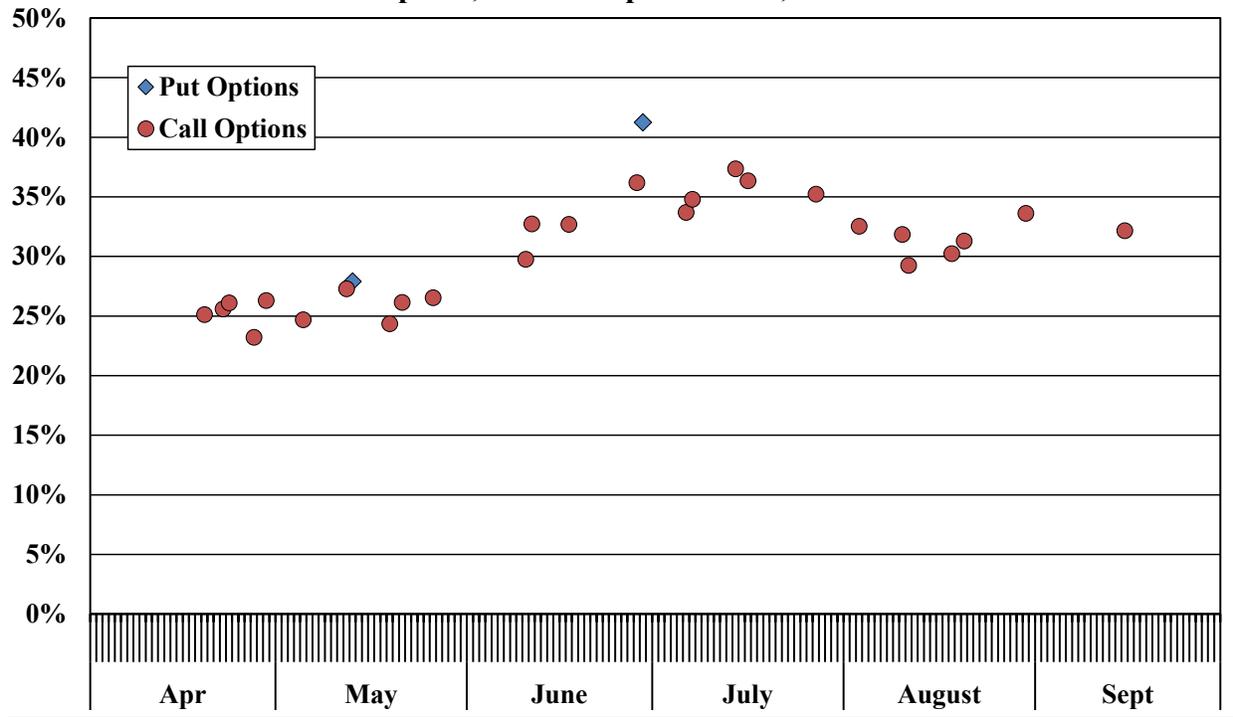
Observations regarding the option-implied volatility of CO₂ allowance prices shown in Figure 3:

- Implied volatility was around 25 percent in April, rose to 30 percent by early June, and then hovered near 40 percent by the end of July. From late July through September, it fell slightly but remained in a band between 30 and 35 percent. This reflects expectations of increased allowance price volatility since late-May/early June.
- Overall, option-implied volatility levels averaged 33 percent in the third quarter of 2021, compared to 29 percent in the previous quarter.
- As allowance prices approach \$13/ton, the CCR, which is set at \$13 in 2021, will become more effective as a factor in reducing price volatility.

⁵ In 2021, the sizes of the CCR and the CCR trigger price are set in accordance with the 2017 Model Rule. The CCR trigger price is set at \$13.00 in 2021 and will rise 7 percent each year. Details are provided [here](#).

⁶ In 2021, the size of the ECR is set equal to 10 percent of the budgets of states implementing the ECR. The ECR trigger price for 2021 is \$6.00 and will rise 7 percent each year. Details are provided [here](#).

**Figure 3: Option-Implied Volatility of CO₂ Allowance Futures Prices
April 1, 2021 to September 30, 2021⁷**



⁷ Positions that settle shortly after the initial execution of their trade are excluded from this figure (e.g., positions opened in May 2021 to close in June 2021 are not shown).

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) 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.

Key observations regarding trading volumes and open interest in the third quarter of 2021:

- Futures trading volume was 82.7 million CO₂ allowances in the third quarter of 2021, up from 57.3 million in the second quarter of 2021 and 28.1 million in the third quarter of 2020. (when there was a significant reduction in economic activity due to the pandemic).
- Physical allowance transfers between unaffiliated firms totaled 8.1 million in the third quarter of 2021, decreased by 44 percent from the previous quarter, but was 24 percent higher than the third quarter of 2020.
- Open interest in RGGI futures and options increased from 84.9 million allowances at the end of the second quarter of 2021 to 114.9 million by the close of the third quarter of 2021.
- Increased futures trading activity has coincided with increasing participation of money managers and swap dealers in the futures market.
- There were 166 million CO₂ allowances in circulation at the end of the quarter. Compliance-oriented entities held approximately 66 million of the allowances in circulation (40 percent). Approximately 75 million of the allowances in circulation (45 percent) are believed to be held for compliance purposes.

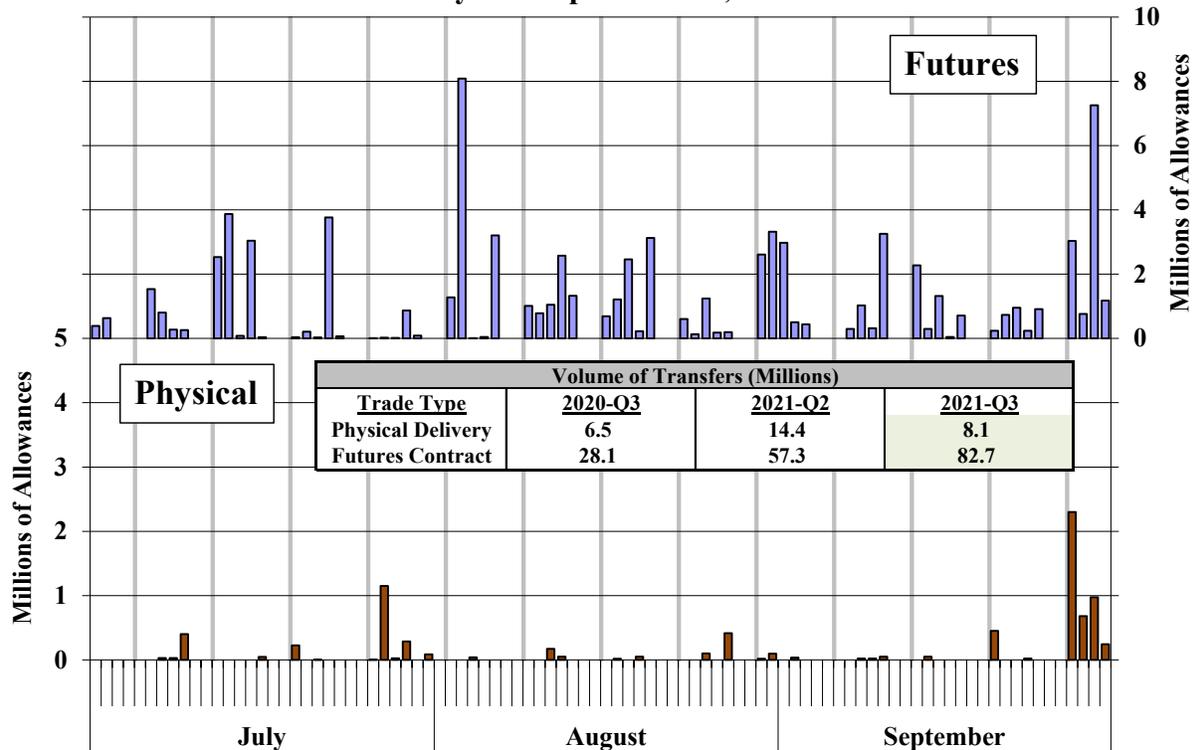
Volume of CO₂ Allowance Transfers, Futures, and Options

Figure 4 summarizes the volume of transfers of CO₂ allowances between the COATS accounts of unaffiliated firms and the volume of trading of RGGI futures listed on ICE and Nodal Exchange.⁸ The figure also shows the volume of transfers in the third quarter of 2021 compared to the previous quarter and to the third quarter of 2020. The volume of futures trading and

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

transfers of CO₂ allowances for each control period are shown together because all CO₂ allowances are interchangeable for compliance purposes.

**Figure 4: Volume of CO₂ Allowance Transfers Between Unaffiliated Parties
July 1 to September 30, 2021**



Key observations regarding physical CO₂ allowance transfers between unaffiliated firms:

- The volume of CO₂ allowance transfers between unaffiliated firms was 8.1 million, which fell 44 percent from the previous quarter but was 24 percent higher than the third quarter of 2020.
- More CO₂ allowance transfers occurred in the last few business days of the month, particularly September, when futures contracts settle, reflecting that most result from settlement of futures contracts.

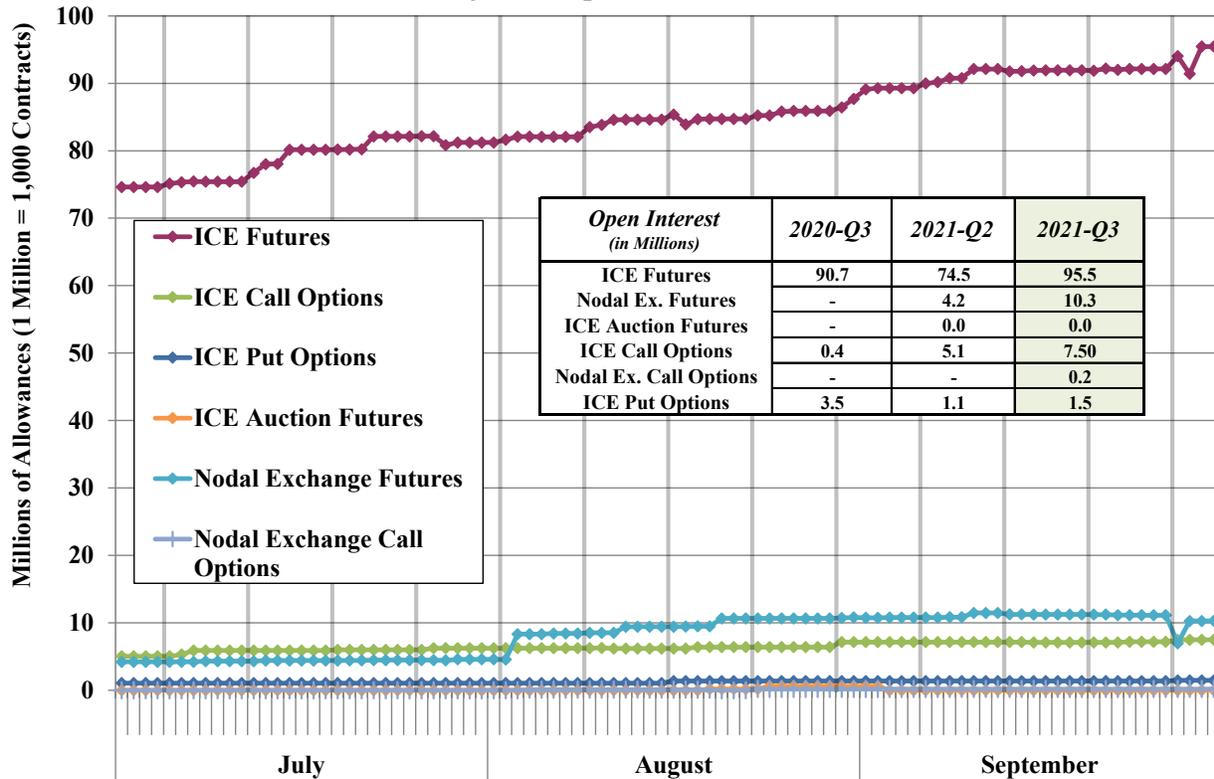
Key observations regarding the volume of trading of RGGI futures and options contracts:

- The total volume of RGGI futures trading was 82.7 million allowances in the third quarter, up 44 percent from the second quarter and nearly three times the third quarter 2020 trading volume.
- Of futures trading volumes during the third quarter of 2021, approximately 7 percent was for contracts that settled during the quarter or in October 2021, 59 percent was for contracts that settle in December 2021, and 34 percent was for contracts that settle in December 2022.

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 third quarter of 2021. 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 Nodal Exchange. 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 on ICE, while the purple line shows Nodal Exchange call options.

**Figure 5: Open Interest in RGGI Futures and Options
July 1 to September 30, 2021**



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

- The total open interest in RGGI futures on ICE increased from 74.5 million allowances at the end of the second quarter of 2021 to 95.5 million allowances by the close of the third quarter of 2021.

- Open interest in RGGI futures on Nodal Exchange increased from 4.2 million at the close of the second quarter to 10.3 million at the close of the third quarter.
- Open interest in RGGI put options on ICE increased from 1.1 million in the second quarter to 1.5 million by the end of the third quarter of 2021, and open interest in call options on ICE increased to 7.5 million.
- RGGI Auction Futures⁹ had zero open interest at the start of the quarter, peaked at 1.1 million, and soon dropped to zero in early September just before the auction. In September, a small number of RGGI Auction Futures for Auction 53 converted to regular RGGI futures.
- There was 0.2 million of open interest in call options on Nodal Exchange by the end of the third quarter, but Nodal Exchange put option open interest remained at zero.
- Overall, the level of open interest across RGGI options and futures products increased substantially from the close of the second quarter of 2021 to the close of the third quarter of 2021.

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”)¹⁰ for each week when greater than 20 firms have reportable positions in a particular product.

Figure 6 summarizes the concentration of open interest in 2020, 2021, and 2022 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

⁹ 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](#).

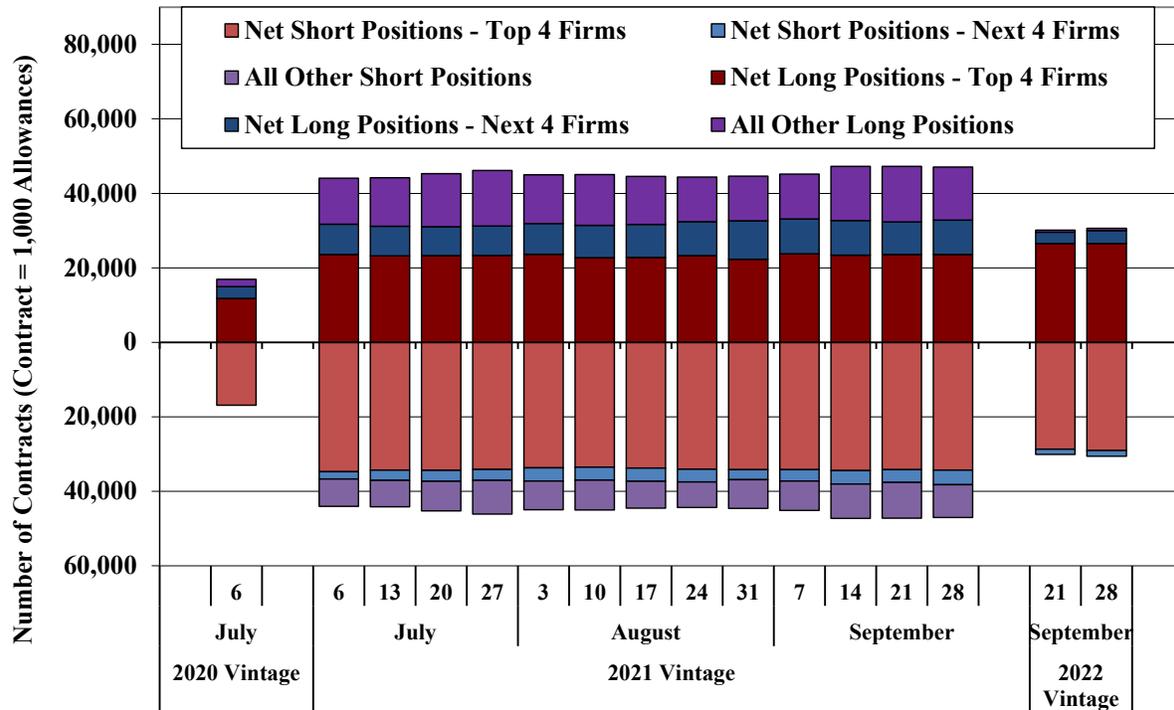
¹⁰ Each day, firms with an open interest of 25 contracts or more are required to report their positions to the CFTC. The CFTC categorizes each firm as Commercial if it engages in trading primarily to supply its own need for allowances or Non-Commercial if it trades for another purpose. Hence, compliance entities are generally designated as Commercial and other entities are frequently designated as Non-Commercial. Each Tuesday, the CFTC issues the COT report, which is a summary of the long and short positions of participants in the market.

largest short positions, (ii) the four firms with the largest short positions not including the Top 4, and (iii) all other short positions.

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 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.

**Figure 6: Concentration of Open Interest in ICE Futures and Options
July 1 to September 30, 2021**



**Figure 7: Concentration of Open Interest in ICE Futures and Options by Type
July 1 to September 30, 2021**

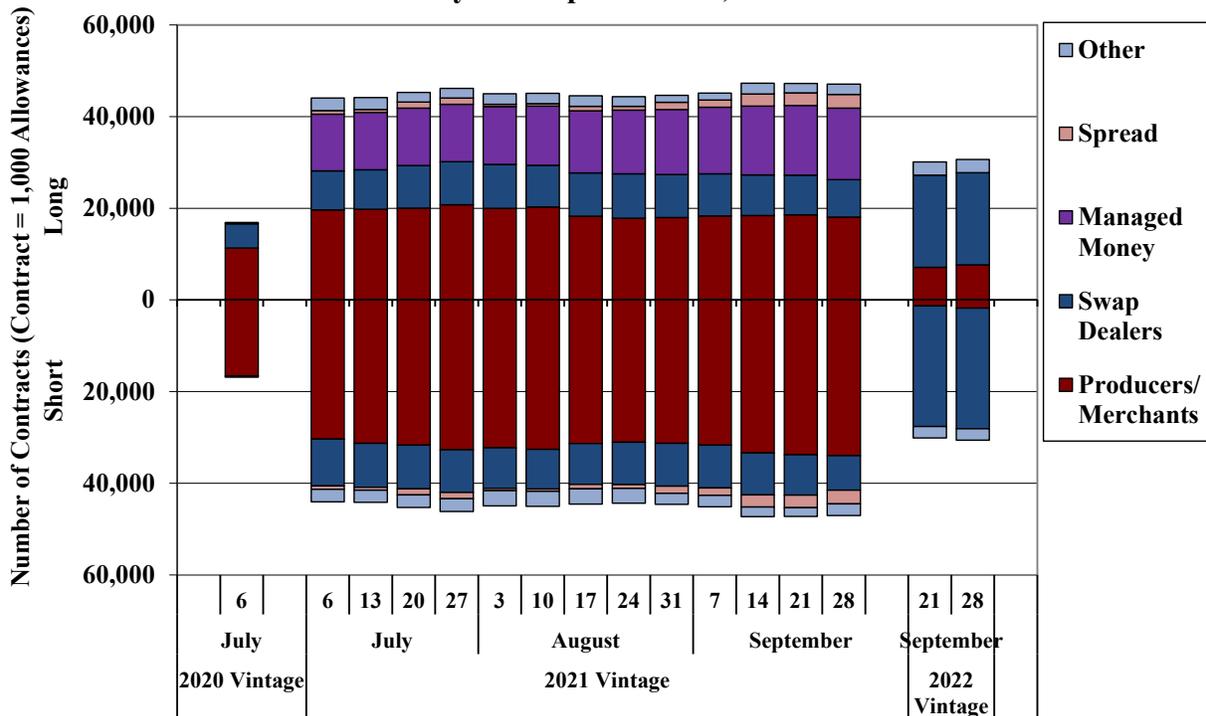
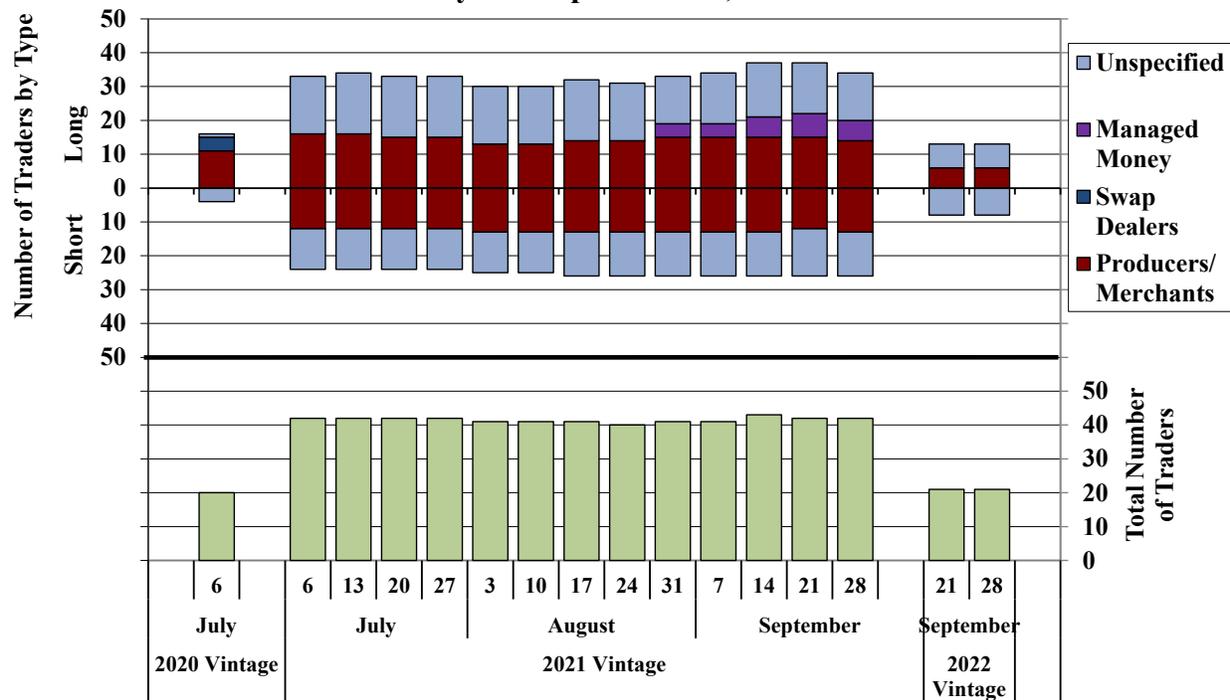


Figure 8: Number of Traders in ICE Futures and Options by Type
July 1 to September 30, 2021¹¹



Key observations regarding the concentration of open interest:

- Although many firms have open interest in RGGI CO₂ allowance futures and options, a small number of firms account for large shares of the net long and short positions in 2021 Vintage contracts.
- Open interest in 2021 Vintage contracts moved up and down slightly throughout the quarter. The quarter ended with a 6 percent increase in open interest, primarily the result of gains made in the second week of September.:
 - ✓ The “Top Four” Firms’ concentration for net long positions in 2021 Vintage contracts first decreased from 54 percent at the beginning of July to 50 percent at the end of September, while concentration in net short positions decreased from 79 to 73 percent.
 - ✓ The biggest decline in “Top Four” concentration occurred in the second week of September when money managers appeared to be more active in the markets.

¹¹ Note: Fewer than four swap dealers were active traders for 2021 and 2022 Vintage and are not shown in Figure 8, but swap dealers’ open interest for these vintages are shown in Figure 7. Similarly, while the amount of open interest attributed to money managers in Figure 7 is significant, Figure 8 suggests that prior to the last week of August, fewer than four traders fell into the money manager category. There were seven and six money manager traders for 2021 Vintage futures and options in the last two weeks of the quarter, respectively.

Participation of money managers increased in September for both open interest and the number of traders.

- ✓ On a weekly basis, the “Top Four” Firms accounted for an average of 51 percent (not weighted by volume) of the total net long positions in 2021 Vintage contracts during the quarter, while 71 percent of the total net long positions were held by eight firms.
- ✓ On a weekly basis, the “Top Four” Firms accounted for an average of 75 percent (not weighted by volume) of the total net short positions in 2021 Vintage contracts during the quarter, while 82 percent of the total net short positions were held by eight firms.
- ✓ The “Next Four” largest short firms accounted for a small amount (between 5 and 8 percent) of net short open interest, indicating that some of these firms also hold long positions in 2021 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.
- The open interest of 2020 Vintage contracts was unchanged at 17 million from the prior quarter, but the number of traders with reportable positions fell below 20 in the second week of July, so the CFTC did not publish information thereafter.
 - ✓ The “Top Four” Firms accounted for 70 percent of the total net long positions in 2020 Vintage contracts, while 89 percent of the total net long positions were held by eight firms.
 - ✓ The “Top Four” Firms accounted for all the total net short positions in 2020 Vintage contracts during the month.
- Open interest of 2022 Vintage contracts was 30.6 million with the “Top Four” Firms accounting for 87 and 95 percent of long and short positions, respectively, at the end of the quarter.
- The concentration of 2021 Vintage open interest long positions held by investment-oriented categories – money managed and swap dealers – rose from 48 percent at the beginning of the quarter to 51 percent by the end.
 - ✓ The growth in money managed positions accounts for most of the increase investment-oriented positions. There were six money managed traders at the end of the quarter and up from fewer than four in July.
 - ✓ The money managed 2021 Vintage open interest rose by 26 percent, while merchant/producers net long positions declined by 7 percent during the quarter.
 - ✓ The increase in money managed open interest was slightly more than the overall increase in total open interest during 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 CO₂ 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 CO₂ allowances, which is discussed further in Section E.

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. The ability of an individual firm to hoard is limited by the substantial private bank of CO₂ 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 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. Nevertheless, the CFTC has access to confidential transaction data, which allows it to monitor for evidence of manipulative conduct.