RGGI Inc.

REPORT ON THE SECONDARY MARKET FOR RGGI CO_2 ALLOWANCES: FOURTH QUARTER 2020

Prepared for:

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

Prepared By:

POTOMAC ECONOMICS

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The Regional Greenhouse Gas Initiative (RGGI) was the first mandatory market-based regulatory program in the U.S. to reduce greenhouse gas emissions. The Regional Greenhouse Gas Initiative (RGGI) is a cooperative effort of Eastern states of the U.S. to reduce emissions of carbon dioxide (CO_2) from the power sector.

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

A. INTRODUCTION AND SUMMARY

The primary market for RGGI CO_2 allowances consists mainly of the auctions where allowances are initially sold. Once a CO_2 allowance is purchased in the primary market, it can then be resold in the secondary market. The secondary market for RGGI CO_2 allowances comprises the trading of physical allowances and financial derivatives, such as futures and options contracts.

The secondary market is important for several reasons. First, it gives firms an ability to obtain CO_2 allowances at any time during the three months between the RGGI auctions. Second, it provides firms a way to protect themselves against the potential volatility of future auction clearing prices. Third, it provides price signals that assist firms in making investment decisions in markets affected by the cost of RGGI compliance.

This report provides a summary of activity in the secondary market in the fourth quarter of 2020 and discusses the results of our market power screens.

- *Secondary Market Activity* – Allowance transfers in COATS and futures trading volumes increased from both the third quarter of 2020 and fourth quarter of 2019.
  - ✓ Allowance transfer volumes increased significantly ahead of the compliance deadline for the fourth control period (on March 1, 2021).
  - ✓ The volume of trading of RGGI futures was slightly more than 128 million CO_2 allowances in the fourth quarter of 2020, more than 3 times greater than the third quarter of 2020 and up 10 percent from the fourth quarter of 2019.
  - ✓ Open interest in RGGI futures decreased from 103.1 million allowances to 55.1 million allowances by the close of the quarter. This reduction in open interest typically occurs at the end of the year since the benchmark RGGI allowance futures contract reaches delivery at the end of each December.
- *CO_2 Allowance Prices* – Allowance futures prices averaged $7.31, up from previous quarters.
  - ✓ Futures prices opened the quarter near $6.75, increased significantly from late-October to early-November, plateaued through mid-November, then increased slightly until mid-December. In the second week of December, prices jumped by more than $0.20 and then rose steadily to close the year just above $8.
  - ✓ Auction 50 cleared at $7.41, which was in line with futures prices at the time.
  - ✓ Current price levels in the secondary market are influenced by the Emission Containment Reserve ("ECR"), which will be introduced with a $6.00 trigger price in the auctions held in 2021. The trigger price will then rise 7 percent each year through 2030.

- *CO_2 Allowance Holdings* – At the end of the fourth quarter of 2020:
  - ✓ There were 231 million CO_2 allowances in circulation.
  - ✓ Compliance-oriented entities held approximately 155 million of the allowances in circulation (67 percent).
  - ✓ Approximately 167 million of the allowances in circulation (72 percent) are believed to be held for compliance purposes.

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

B. BACKGROUND

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

- *Futures* – Under these contracts, two parties agree to exchange a fixed number of CO_2 allowances of a certain vintage year at a particular price at a specific point in the future (called the "delivery month"). At the end of the delivery month, the contracted number of CO_2 allowances must be physically transferred to the buyer's account in the COATS registry and funds must be transferred to the seller. 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 CO_2 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 2020 expiration date. If the price of the corresponding forward contract rose to $5.75, the firm could exercise the option to buy CO_2 allowances at $5 and immediately sell them at $5.75. Alternatively, if the price of the forward contract stayed 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 CO_2 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.

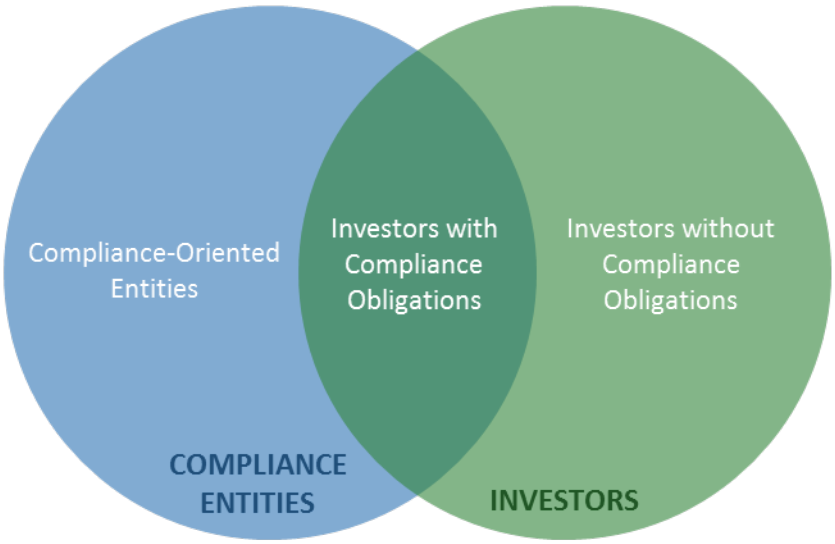
The volatility of a CO_2 allowance refers to the expected standard deviation of the distribution of allowance prices one year in the future. For example, if the expected value of the price one year

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 CO_2 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,[2] and their affiliates.[3] 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] Before Virginia announced on June 8, 2020 that it would participate in RGGI beginning in January 2021, firms owning Budget Sources in Virginia but not in current Participating States were not treated as compliance entities. However, since the announcement such firms are treated as compliance entities in our reports.

[3] 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_2 allowances in the fourth quarter of 2020. Figure 2 summarizes transaction prices in the secondary market for CO_2 allowances, including the prices of allowance transfers registered in COATS[4] and the prices of futures contract trades on the Intercontinental Exchange ("ICE") and Nodal Exchange.

Key observations regarding RGGI CO_2 allowance prices:

- Futures prices opened the quarter near $6.75, increased significantly from late-October to early-November, plateaued through mid-November, then increased slightly until mid-December. In the second week of December, prices jumped by more than $0.20 and then rose steadily to close the year just above $8.
- Prices of COATS transfers were generally consistent with futures prices throughout the quarter. However, several COATS transactions were reported with much lower prices than current market trends; these transfers likely reflect contracts with terms determined months or years prior to the transfer.
- The clearing price in Auction 50, which was held on December 2, was $7.41. This was in line with futures prices at the time.
- Options trading activity increased slightly from the third quarter. Five option trades were recorded in the fourth quarter with strike prices ranging from $6.00 to $10.00.
- Current price levels in the secondary market are influenced by the Emission Containment Reserve ("ECR"), which will be introduced with a $6.00 trigger price in the auctions held in 2021. The trigger price will then rise 7 percent each year through 2030.

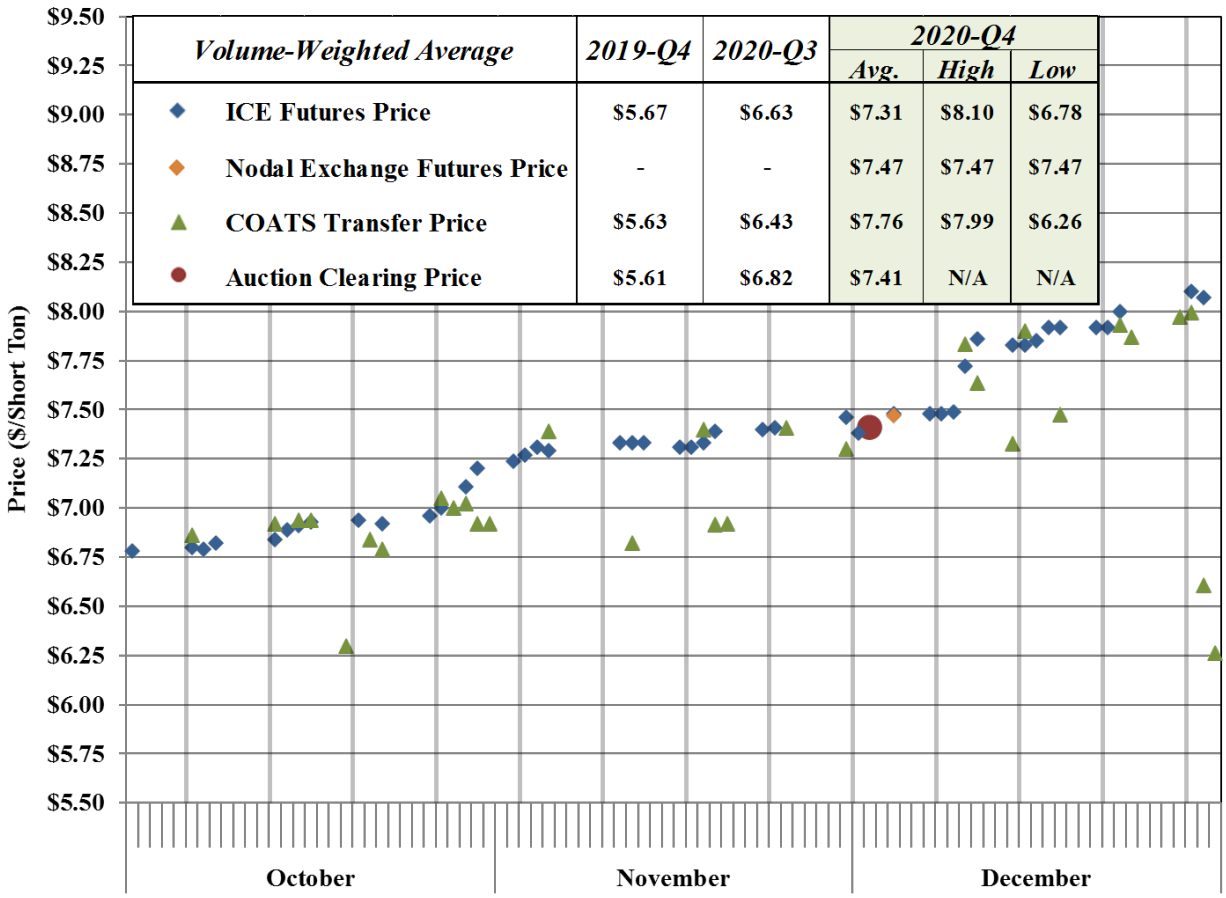
Prices of CO_2 Allowances and Allowance Derivatives

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_2 allowances that were sold in RGGI Auction 50, which was held on December 2. Figure 2 also shows volume-

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

weighted average prices for each category in the fourth quarter of 2020 compared to the previous quarter and the fourth quarter of the previous year. Additionally, high and low values are presented for the daily volume-weighted average values. CO_2 allowances that are usable for compliance in the fourth control period are shown.

Figure 2: Prices in the Secondary Market for RGGI CO_2 Allowances[5] October 1 to December 31, 2020[6]



[5] Sources: Auction clearing prices are available at https://www.rggi.org/auctions/auction-results, ICE futures prices are available at www.theice.com, Nodal Exchange futures prices are available at https://www.nodalexchange.com/, 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.

[6] The COATS transfer price for 2020-Q3 has been revised upwards by $0.01 due to late-reporting transactions. The futures price for 2019-Q4 has been revised down by $0.01 due to a correction in historical data.

Key observations regarding CO_2 allowance prices:

- Futures prices opened the quarter near $6.75, increased significantly from late-October to early-November, plateaued through mid-November, then increased slightly until mid-December. In the second week of December, prices jumped by more than $0.20 and then rose steadily to close the year just above $8.
- COATS transfer prices largely tracked futures prices throughout the quarter, but there were several transactions that were priced considerably lower than the general market trends at the time. These transfers likely reflect contracts with terms that were determined months or years prior to when the transfer took place.
- The clearing price in Auction 50 was $7.41, which was in line with secondary market prices leading up to the auction. The auction clearing price increased $0.59 from Auction 49 (which was held in September 2020).

Prices of Options for CO_2 Allowances

The clearing prices of option contracts provide insight about how the market expects the price of the underlying commodity to 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 CO_2 allowances:

- Five option trades were recorded on ICE in the fourth quarter, which was up slightly from the previous quarter but down from the higher levels of activity in the first half of the year.
- Four call options and one put option were traded with strike prices between $6.00 and $10.00. All trades were for settlement in December of either 2020 or 2021.

Volatility of CO_2 Allowance Prices

Market-based emissions reduction programs 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_2 allowance prices decrease the risks associated with making long-term investments in reducing CO_2 emissions. Since CO_2 allowance prices can be volatile, the availability of futures and options contracts allows firms to protect themselves from the risks of such investments.

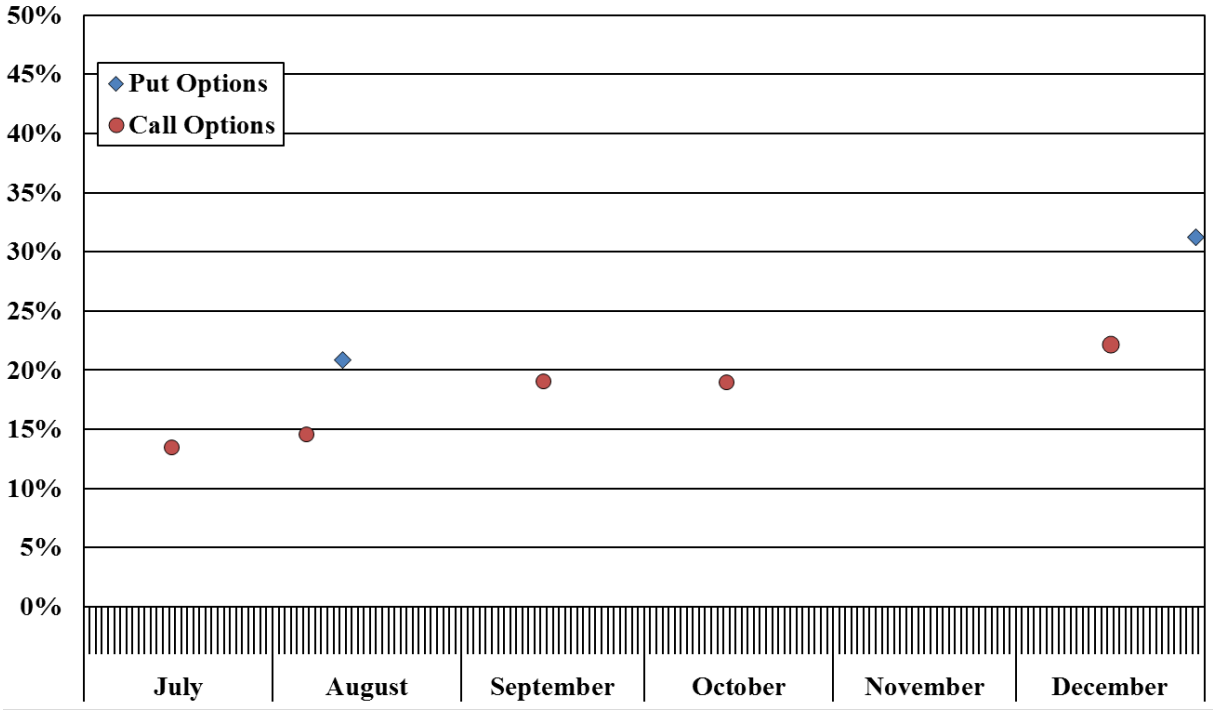
Expected price volatility is affected by elements of the RGGI program that promote allowance price stability. Potential upward price movements are limited by the Cost Containment Reserve ("CCR"), which allows for the sale of a fixed number of allowances in addition to the cap if the auction clearing price reaches the CCR Trigger Price.[7] Potential downward price movements are limited by the Reserve Price, which currently prevents allowances from being sold in the auction at a price below $2.32, and the Emissions Containment Reserve ("ECR"), which will withhold allowances from circulation if prices fall below established trigger prices starting in 2021.[8]

One measure of the volatility of CO_2 allowance prices is known as option-implied volatility, which measures the volatility that is implied by the trading of option contracts for CO_2 allowances. If a firm perceives that CO_2 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_2 allowance prices are relatively stable, the firm will be willing to pay relatively little for the same option contract.

[7] In 2020, the annual withdrawal limit was 11.8 million allowances. The CCR trigger price was $10.77 in 2020. Starting in 2021, the size of the CCR and the CCR trigger price will be 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 thereafter. Additional details are provided at https://www.rggi.org/program-overview-and-design/elements.

[8] Beginning in 2021, the size of the ECR will be equal to 10 percent of the budgets of states implementing the ECR. The ECR trigger price for 2021 will be $6.00 and will rise 7 percent each year thereafter. Details are provided at https://www.rggi.org/program-overview-and-design/elements.

Figure 3: Option-Implied Volatility of CO_2 Allowance Futures Prices
July 1, 2020 to December 31, 2020[9]



Observations regarding the option-implied volatility of CO_2 allowance prices:

- In the third quarter of 2020, implied volatility ranged between 13 and 21 percent.
- In the fourth quarter of 2020, implied volatility ranged between 19 and 31 percent.
- Overall, option-implied volatility levels averaged 24 percent in the fourth quarter of 2020.
- Option-implied volatility in the fourth quarter of 2020 was higher than levels in the third quarter, similar to the second quarter, and lower than observed in the first quarter.

9 Positions that settle shortly after the initial execution of their trade are excluded from this figure (e.g., positions opened in November 2020 to close in December 2020 are not shown).

D. VOLUMES AND OPEN INTEREST

This section evaluates the volume of COATS transactions (i.e., transfers of CO_2 allowances between unaffiliated parties as recorded in COATS) as well as the volume of trading and the level of open interest in exchange-traded futures and options. Figure 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 fourth quarter of 2020:

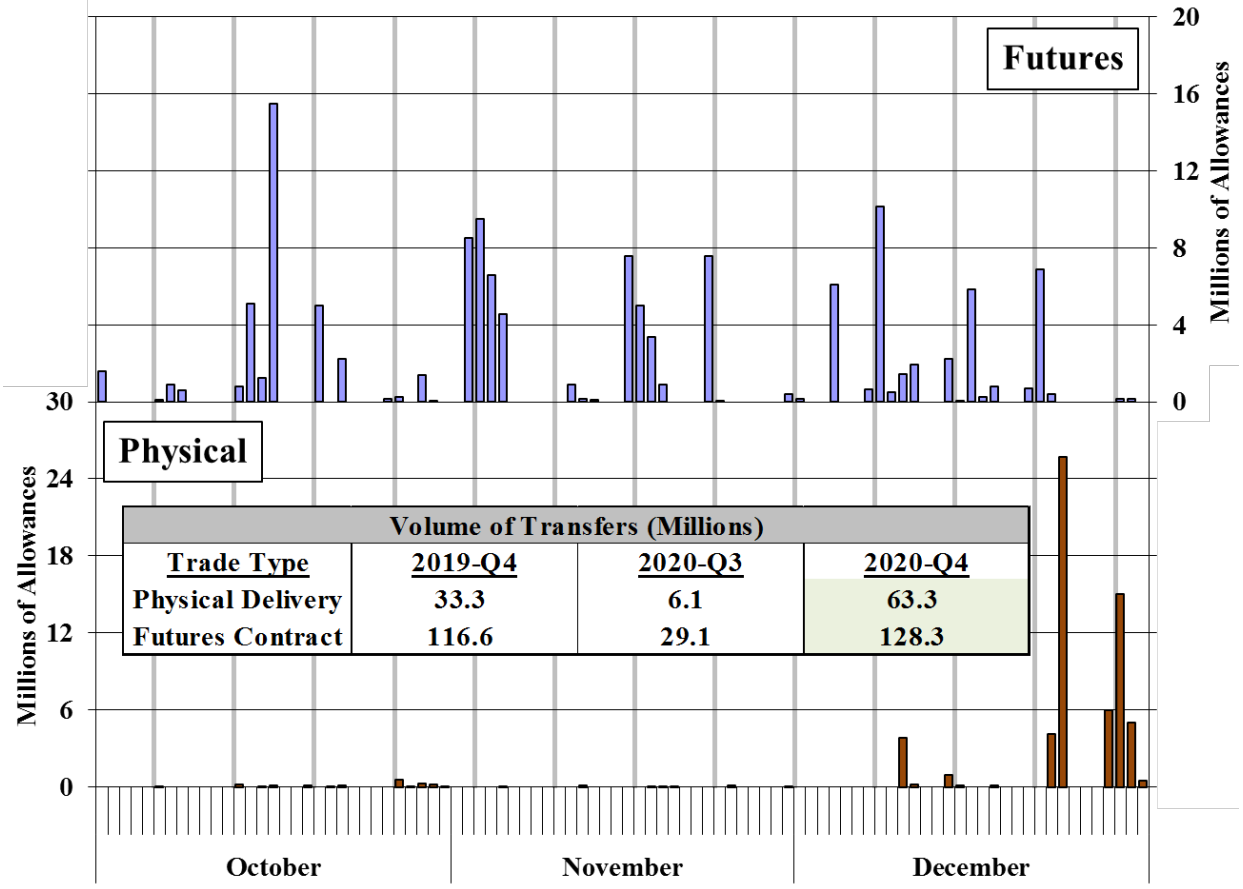
- Trading activity in RGGI futures contracts increased compared to the previous quarter. Futures trading volume was 128.3 million CO_2 allowances in the fourth quarter of 2020, up more than 3 times from the previous quarter and 10 percent from the fourth quarter of 2019.
- Physical allowance transfers between unaffiliated firms increased ten times from the previous quarter and nearly doubled from the fourth quarter of 2019.
- Open interest in RGGI futures decreased from 103.1 million allowances at the end of the third quarter of 2020 to 55.1 million allowances by the close of the fourth quarter.
- There were 231 million CO_2 allowances in circulation at the end of the quarter. Compliance-oriented entities held approximately 155 million of the allowances in circulation (67 percent). Approximately 167 million of the allowances in circulation (72 percent) are believed to be held for compliance purposes.

Volume of CO_2 Allowance Transfers, Futures, and Options

Figure 4 summarizes the volume of transfers of CO_2 allowances between the COATS accounts of unaffiliated firms and the volume of trading of RGGI futures listed on ICE and Nodal Exchange.[10] The figure also shows the volume of transfers in the fourth quarter of 2020 compared to the previous quarter and to the fourth quarter of 2019. The volume of futures trading and transfers of CO_2 allowances for each control period are shown together because all CO_2 allowances are interchangeable for compliance purposes.

[10] 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.

Figure 4: Volume of CO_2 Allowance Transfers Between Unaffiliated Parties[11]
October 1 to December 31, 2020



Volume of Transfers (Millions)

Trade Type	2019-Q4	2020-Q3	2020-Q4
Physical Delivery	33.3	6.1	63.3
Futures Contract	116.6	29.1	128.3

Key observations regarding physical CO_2 allowance transfers between unaffiliated firms:

- The total volume of CO_2 allowance transfers between unaffiliated firms was 63.6 million, up ten times from the third quarter, and nearly double the fourth quarter of 2019.
- Many CO_2 allowance transfers occurred in the last few business days of the month when futures contracts are settled, reflecting that most result from settlement of futures contracts.
- The fourth control period ended in December, so larger transfers than normal were expected.

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

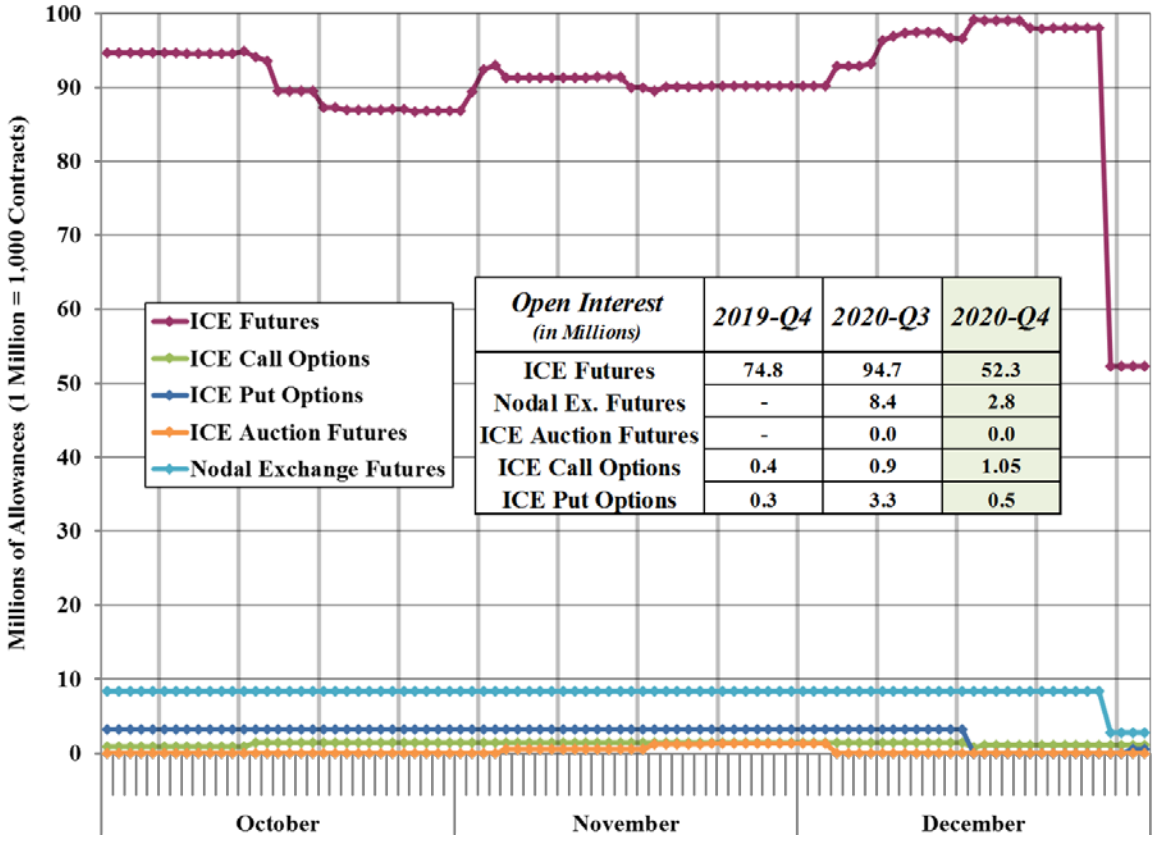
[11] Source: CO_2 allowance transfers are based on information in COATS. Transaction volume from previous quarters has been revised upwards to reflect late-reporting of transactions.

- The total volume of trading of RGGI futures was 128.3 million CO_2 allowances in the third quarter of 2020, more than 3 times the total of the previous quarter and 10 percent above the fourth quarter of 2019.
- Approximately 62 percent of the trading volume of futures contracts listed during the fourth quarter of 2020 was for contracts that settled during the quarter. Additionally, 37 percent of the total volume of trading was for contracts that settle in December 2021.

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 2020. 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.

Figure 5: Open Interest in RGGI Futures and Options
October 1 to December 31, 2020



Open Interest (in Millions)	*2019-Q4*	*2020-Q3*	*2020-Q4*
ICE Futures	74.8	94.7	52.3
Nodal Ex. Futures	-	8.4	2.8
ICE Auction Futures	-	0.0	0.0
ICE Call Options	0.4	0.9	1.05
ICE Put Options	0.3	3.3	0.5

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

- The total open interest in RGGI futures on ICE decreased from 94.7 million allowances at the end of the third quarter of 2020 to 52.3 million allowances by the close of the fourth quarter.
- Open interest in RGGI futures on Nodal Exchange decreased from 8.4 million at the close of the third quarter to 2.8 million at the close of the fourth quarter.
- Open interest in RGGI put options on ICE closed the third quarter at 3.3 million and declined over the fourth quarter to 0.5 million, while open interest in call options on ICE increased to slightly over 1 million.
- RGGI Auction Futures[12] for Auction 50 on ICE opened and closed the fourth quarter with no open interest but peaked at 1.3 million prior to Auction 50.
- There was no open interest in RGGI options on Nodal Exchange in the fourth quarter.
- Overall, the level of open interest across RGGI options and futures products decreased substantially from the close of the third quarter of 2020 to the close of the fourth 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")[13] for each week when greater than 20 firms have reportable positions in a particular product.

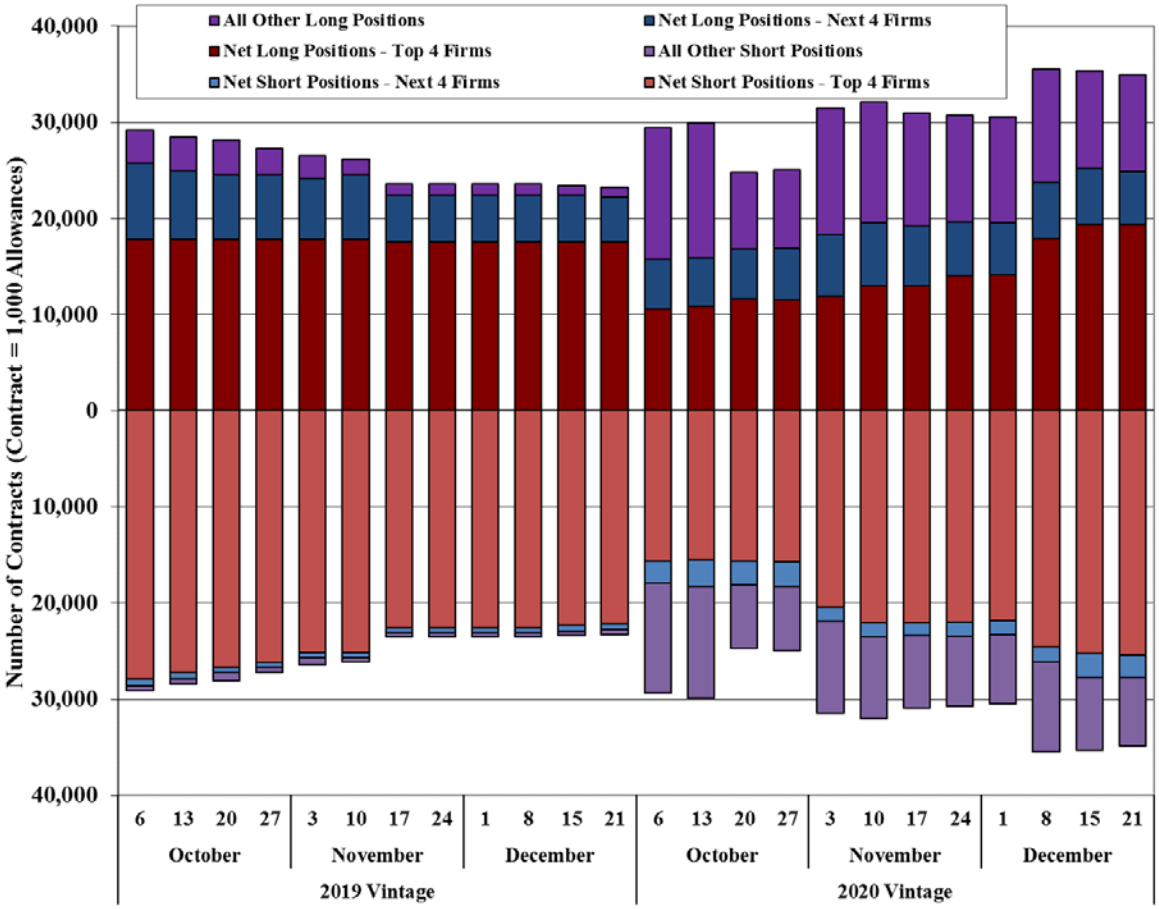
Figure 6 summarizes the concentration of open interest in 2019 and 2020 vintage ICE futures and options contracts. The figure reports the net long positions in three categories: (i) the four firms with the largest long positions, (ii) the four firms with the largest long positions not including the Top 4, and (iii) all other long positions. The figure also reports the net short

[12] 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: https://www.theice.com/products/71090479/Regional-Greenhouse-Gas-Initiative-Allowance-Auction-Clearing-Price

[13] 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.

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.

Figure 6: Concentration of Open Interest in ICE Futures and Options
October 1 to December 31, 2020



Key observations regarding the concentration of open interest:

- Although many firms have open interest in RGGI CO_2 allowance futures and options, a small number of firms account for large shares of the net long and short positions in 2019 and 2020 Vintage contracts.
- Open interest in 2020 Vintage contracts increased during the fourth quarter, although the peak was prior to December settlement:
  - ✓ The "Top Four" Firms' concentration for net long positions in 2020 Vintage contracts increased from 36 percent to 55 percent during the quarter, while concentration in net short positions increased from 53 to 73 percent. The increase in concentration resulted from increased short and long positions by the top firms.

- ✓ On a weekly basis, the "Top Four" Firms accounted for an average of 45 percent (not weighted by volume) of the total net long positions in 2020 Vintage contracts during the quarter, while 63 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 66 percent (not weighted by volume) of the total net short positions in 2020 Vintage contracts during the quarter, while 73 percent of the total net short positions were held by eight firms.

- Concentration in 2019 Vintage contracts increased from 61 percent to 76 percent for "Top Four" net long positions and decreased from 96 to 95 percent for the "Top Four" net short positions during the fourth quarter of 2020, while open interest declined by 20 percent.
- 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_2 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_2 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_2 allowance market in order to identify anticompetitive conduct. Additionally, the Commodity Futures Trading Commission ("CFTC") evaluates trading in the secondary CO_2 allowance market consistent with its role as the regulator of derivative markets in the U.S. This section discusses two types of anti-competitive conduct for which we monitor. As in previous reports on the secondary market, we find no evidence of anti-competitive conduct.

In any commodity market, one potential concern is that a firm could hoard a substantial share of the supply of a commodity to influence prices or to prevent a competitor from obtaining CO_2 allowances. Hence, we screen information on the holdings of CO_2 allowances and allowance-derivatives and the demand for allowances to identify firms that might acquire a position that raises competitive concerns. The ability of an individual firm to hoard is limited by the substantial private bank of CO_2 allowances that has been accumulated and also by the market rules, particularly the auction rules that limit the amount of allowances that can be purchased by a single party or group of affiliated parties in a single offering to 25 percent.

Another potential concern is that a firm expecting to purchase CO_2 allowances in the auction might sell a large number of futures contracts in an effort to push the price of the contracts below the competitive level. Such a firm might profit from buying a large number of CO_2 allowances in the auction at a discount if the bidding in the auction were influenced by the depressed futures price. For this to be a profitable strategy, the firm would need to be able to substantially depress the futures price with a relatively small amount of sales—an amount smaller than the amount of CO_2 allowances it planned to buy in the auction. The best protection against this strategy is a market where other firms respond by making additional purchases. Firms that are looking for an opportunity to reduce their short positions or to purchase CO_2 allowances for their future compliance needs help limit the effectiveness of a strategy to depress prices below the competitive level. Nevertheless, the CFTC has access to confidential transaction data, which allows it to monitor for evidence of manipulative conduct.