

Auction Examples

Ontario Cap and Trade Program Auction of Greenhouse Gas Allowances

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I. INTRODUCTION

This document provides additional guidance for participants of Ontario’s cap and trade program and includes information on:

- how to determine the amount of a bid guarantee;
- bid evaluation procedures for purchase limits;
- holding limits and bid guarantees;
- the settlement price determination process; and,
- how auctions are settled.

This document is intended to be used as guidance only and in the case of any conflict or doubt between this document and the *Climate Change Mitigation and Low-carbon Economy Act, 2016* or any of its regulations, the legislation shall prevail.

This document should be read in conjunction with the Detailed Auction Requirements and Instructions document. Terms defined in the Detailed Auction Requirements and Instructions also apply to this document.

When bidding in an auction during the open bidding window, the bid price, number of bid lots, and instrument vintage are entered for each bid. When placing bids for the Current Auction (i.e. for allowances from the current budget year / year of the auction), the vintage selection is “Current.” The vintage to be selected when placing bids in the Advance Auction is the year of the allowances offered in the Advance Auction (e.g. in 2017, vintage 2020 allowances are offered for Advance Auction and the vintage selection is 2020).

The Settlement Price in an auction is determined after the bidding window is closed based on the following steps:

1. Each participant’s submitted bids are evaluated to ensure that submitted bids or value of submitted bids do not exceed the purchase limits, holding limits, or the participant’s bid guarantee.
2. Each participant’s qualified bids are determined as the bid quantity that remains after the submitted bids have been evaluated and reduced to meet all limits.
3. Qualified bids are ranked in order of bid price, from highest to lowest.
4. Allowances are awarded to participants, beginning with the highest qualified bid price and moving to successively lower qualified bid prices, until the entire supply of

allowances is exhausted or all qualified bids have been filled.

The discussion of the settlement price determination in this document follows the steps listed above.

II. DETERMINING A PARTICIPANT'S BID GUARANTEE

Table 1 below presents hypothetical bid submissions for an auction in which seven participants are participating. Each participant's set of bids is referred to as a bid schedule in the remainder of this document. In the following examples, it is assumed that each of the participants is only bidding in the Current Auction. Considerations for participation in the Advance Auction are included in the next section and at the end of this document. Each row in Table 1 provides the bid value at each bid price. The Auction Administrator will accept bids for lots of allowances; each bid lot represents 1,000 allowances.

The cumulative allowances shown in Table 1 are not entered or shown in the bid schedule, but are shown here for illustrative purposes. The "Participant Cumulative Allowances" column indicates the total allowances for which the Participant has submitted bids to purchase at that bid price and all higher bid prices.

Table 1 Terminology:

Bid Number of Allowances = Bid Lots * 1,000

Participant Cumulative Allowances = Sum of current Bid Number of Allowances and Bid Number of Allowances at each higher Bid Price

Participant Cumulative Bid Value = Participant Cumulative Allowances * Bid Price

Participant Maximum Bid Value = Participant Cumulative Bid Value at Bid Price where Participant Cumulative Bid Value is greatest

The Maximum Bid Value for each participant is highlighted in grey (in the Participant cumulative bid value column) in Table 1.

Table 1: Bid Submissions for All Auction Examples

Participant Name	Bid Price	Bid Lots	Bid Number of Allowances	Participant Cumulative Bid Allowances	Participant Cumulative Bid Value
A	\$28.64	40	40,000	40,000	\$1,145,600
A	\$23.29	55	55,000	95,000	\$2,212,550
A	\$19.48	70	70,000	165,000	\$3,214,200
A	\$15.65	85	85,000	250,000	\$3,912,500
B	\$21.35	80	80,000	80,000	\$1,708,000
B	\$15.30	170	170,000	250,000	\$3,825,000
C	\$54.35	25	25,000	25,000	\$1,358,750
C	\$49.18	100	100,000	125,000	\$6,147,500
C	\$35.80	40	40,000	165,000	\$5,907,000
D	\$27.19	50	50,000	50,000	\$1,359,500
D	\$23.22	120	120,000	170,000	\$3,947,400
E	\$24.90	35	35,000	35,000	\$871,500
E	\$22.15	50	50,000	85,000	\$1,882,750
E	\$19.48	70	70,000	155,000	\$3,019,400
E	\$15.28	110	110,000	265,000	\$4,049,200
F	\$15.28	200	200,000	200,000	\$3,056,000
G	\$24.90	50	50,000	50,000	\$1,245,000
G	\$23.22	120	120,000	170,000	\$3,947,400

The Ontario Regulation requires bid guarantees to be greater than or equal to the participant maximum bid value. Thus, each participant’s bid guarantee should be equal to or greater than the maximum bid value for the planned bid schedule in Table 1. Participants bidding in an auction will be limited to incurring a total cost less than or equal to the dollar amount of the bid guarantee submitted and should evaluate their bids against the bid guarantee they provided in the manner illustrated in the Example 1 below.

Example 1 shows how participants might calculate the minimum bid guarantee required to avoid having their bids rejected:

Example 1: Calculating a Bid Guarantee When Submitting Multiple Bids

As shown in Table 1, Participant A has submitted four different bids at four different bid prices:

- i) Bid price of \$28.64: Participant A bid for 40,000 allowances at a value of \$1,145,600.
- ii) Bid price of \$23.29: Participant A bid for 95,000 allowances at a value of \$2,212,550. (95,000 allowances = 40,000 + 55,000)
- iii) Bid price of \$19.48: Participant A bid for 165,000 allowances at a value of \$3,214,200. (165,000 allowances = 40,000 + 55,000 + 70,000)
- iv) Bid price of \$15.65: Participant A bid for 250,000 allowances at a cost of \$3,912,500. (250,000 allowances = 40,000 + 55,000 + 70,000 + 85,000)

Participant A's bid schedule shows that it is willing to purchase a total of 250,000 allowances at a price of \$15.65 at a maximum bid value of \$3,912,500. **Participant A should submit a bid guarantee of at least \$3,912,500 if it wants to buy all the allowances in its bid schedule as highlighted in Table 1.**

Using the same evaluation process for the bid schedules submitted by Participants B to G, the maximum bid value of each participant's bid schedule is shown in Table 1, highlighted in grey.

The minimum bid guarantee Participants A to G should submit to avoid having their bid(s) rejected in lots of 1,000 allowances by the Auction Administrator would be as follows:

- Participant A – \$3,912,500
- Participant B – \$3,825,000
- Participant C – \$6,147,500
- Participant D – \$3,947,400
- Participant E – \$4,049,200
- Participant F – \$3,056,000

- Participant G – \$3,947,400

NOTE: As the Auction Exchange Rate that will be used to determine the Auction Reserve Price will not be known until after the bid guarantee is submitted by a participant, i.e. on the business day prior to the auction, participants should consider the effect of a change in the exchange rate on the Auction Reserve Price when determining the amount of the bid guarantee to be submitted.

III. BID GUARANTEES FOR CURRENT AND ADVANCE AUCTIONS

Participants submit a single bid guarantee for both the Current Auction and the Advance Auction. Once the Current Auction settlement price has been determined, the participant's total cost for allowances awarded in the Current Auction (settlement price multiplied by number of allowances awarded) will be determined and deducted from the bid guarantee amount, and any bid guarantee amount remaining will be applied to the participant's bids in the Advance Auction.

Example 2: Application of a Single Bid Guarantee to Current and Advance Auction

Bearing in mind the examples in Table 1 were assumed to be for the Current Auction only, a participant may wish to submit a bid guarantee greater than their highest cumulative bid value for Current Auction bids in order to be able to ensure ability to participate in the Advance Auction. For example, If Participant A in Table 1 submitted a bid guarantee of \$10,000,000 and the auction settlement price for the Current Auction is \$18.52, then the cost of allowances awarded in the Current Auction is \$3,055,800 (165,000 allowances * \$18.52).

Participant A's remaining bid guarantee amount would be \$6,944,200 (\$10,000,000 - \$3,055,800) and would be available to be applied to bids submitted for the Advance Auction.

IV. PARTICIPANT BID EVALUATION PROCEDURES FOR PURCHASE LIMITS AND HOLDING LIMITS

Example 3 and Example 4 below illustrate how participants should evaluate their Current Auction bid schedules for purchase limits and holding limits.

A. Purchase Limits

The auction purchase limit applies to a participant or a group of participants that are members of a Corporate Association Group¹. The purchase limit percentages identified below apply to the total number of allowances offered for sale in the Current Auction and independently to the total number of allowances offered for sale in the Advance Auction.

- The purchase limit for Capped Participants¹ is 25 percent of the allowances offered for auction; and
- The purchase limit for Market Participants¹ is 4 percent of the allowances offered for auction.

Example 3: Determining a Participant's Purchase Limit

For each category of participant (Capped or Market), multiply the purchase limit percentage for the participant category by the total amount of allowances available for auction. While the purchase limit percentages are the same for each auction, the allowance supply for the Current Auction and the Advance Auction are not, and thus the number of allowances a participant can purchase in the Current and Advance Auction without exceeding the purchase limit is different. For example, if the number of allowances offered for sale in the Current Auction is 1,000,000, the Current Auction purchase limit for a Capped Participant is 250,000 allowances ($0.25 * 1,000,000$). Similarly, if the number of allowances offered for sale in the Advance Auction is 400,000, the Advance Auction purchase limit for a Capped Participant is 100,000 allowances ($0.25 * 400,000$).

B. Holding Limits

The holding limit is the maximum number of allowances a participant may hold or the maximum number of allowances that may be jointly held by a group of participants that are members of a Corporate Association Group.

Allowances purchased in the Current Auction are subject to the current vintage holding limit detailed in section 40 of the Regulation. The current vintage holding limit applies to allowances from the current or earlier calendar year.

There is a separate holding limit for each calendar year of allowances with a vintage year beyond

¹ For a definition of this term, please refer to the Detailed Auction Requirements and Instructions document.

the current calendar year. For the Advance Auction, allowances purchased in the Advance Auction are subject to the holding limit for the vintage year of the allowances sold at that Advance Auction pursuant to section 42 of the Regulation.

The holding limit for a particular year applies to all participants and is based on the following formula:

$$\text{Holding Limit} = 2,500,000 + 0.025 * (\text{Annual Allowance Budget} - 25,000,000)$$

Where:

$$\text{Annual Allowance Budget} = \text{the number of allowances issued for that budget year}$$

For 2017, the annual allowance budget in Ontario is 142,332,000 allowances.

$$2017 \text{ Holding Limit} = 2,500,000 + 0.025 * (142,332,000 - 25,000,000)$$

$$2017 \text{ Holding Limit} = 5,433,300 \text{ allowances}$$

A Capped Participant may exempt a limited number of allowances from the current vintage holding limit by transferring them to its compliance account. This “limited exemption” is described in section 41 of the Regulation as a non-application of the holding limit. The limited exemption is based on a participant’s emissions, and is designed to allow Capped Participants the ability to accumulate the allowances they need for compliance. For that reason, the limited exemption is increased each year by the amount of the participant’s emissions as described in the table in section 41 (1) of the Regulation.

The maximum number of allowances a Capped Participant can hold at one time equals the holding limit plus the limited exemption. The limited exemption is the number of allowances that are exempt from the holding limit calculation as described in section 41 of the Regulation, if held by a participant in its compliance account. Assuming a participant takes full advantage of the limited exemption, in 2017 the maximum number of current vintage allowances that may be held is calculated as:

$$\begin{aligned} 2017 \text{ Maximum Number of Current Vintage Allowances Held} \\ = 5,433,300 + \text{Limited Exemption} \end{aligned}$$

Example 4: Determining the Maximum Number of Allowances a Participant Can Hold and Purchase to Comply with the Holding Limit

When submitting bids in an auction, a participant may not exceed the applicable holding limits. Suppose a participant’s limited exemption is equal to 4,000,000 allowances and it

holds 1,000,000 allowances in its compliance account and an additional 2,000,000 vintage 2017 allowances in its general holding account; in this case, the maximum number of allowances the participant can purchase and stay below the holding limit is:

Maximum Number of Current Vintage Allowances =

$$5,433,300 + 4,000,000 - 1,000,000 - 2,000,000 = 6,433,300 \text{ allowances}$$

In this example, for a participant with a limited exemption of 4,000,000 and 1,000,000 allowances in its compliance account, 3,000,000 allowances purchased at auction could be transferred directly to the participant's compliance account to take full advantage of the limited exemption in compliance with the holding limit.

Participants can hold more allowances in their compliance account than allowed under the limited exemption, but any allowances in excess of the limited exemption will count towards the holding limit. If the participant in this example had a compliance account balance of 4,500,000 allowances, the following represents the allowances which may be purchased without exceeding the holding limit:

Maximum Number of Current Vintage Allowances =

$$5,433,300 + 4,000,000 - 4,500,000 - 2,000,000 = 2,933,300 \text{ allowances}$$

C. Allowances in Excess of the Holding Limit in CITSS

Although the Regulation allows the Minister to transfer allowances awarded in an auction to a participant's general holding account or its compliance account as needed to facilitate compliance with the holding limit, the participant should ensure it makes all necessary transfers itself.

For a participant purchasing allowances at auction that would exceed the current or future vintage holding limit (with limited exemption taken into account), if allowances exceeding the holding limit remain in the participant's CITSS account(s) five (5) days after the auction allowance distribution, the excess allowances may be removed and put back in the Auction Account of the Minister to be sold in a subsequent auction. It is each participant's responsibility to complete any necessary transfer of allowances within five (5) days of the date the holding limit is exceeded to conform to the holding limit as described in sections 40 through 42 of the Regulation.

V. AUCTION ADMINISTRATOR APPLICATION OF THE BID EVALUATION CRITERIA

The Auction Administrator will not accept any bids for which the bid price is less than the Auction Reserve Price. For the purposes of this document and all examples, the Auction Reserve Price for both the Current Auction and Advance Auction is \$13.57 Canadian Dollars (CAD). This example Auction Reserve Price is not representative of the actual anticipated Auction Reserve Price for any auction. For a description of how the Auction Reserve Price is determined, please refer to the Detailed Auction Requirements and Instructions document or the Ontario Auction Participant Training Presentation.

Submitted bids that contain bid quantities in excess of the purchase limit or the holding limit, or have a maximum value in excess of the bid guarantee at the settlement price, will be rejected, in bundles of 1,000 allowances, until all bid limitations are met. Only that portion of the bid quantity that exceeds one or more limit(s) will be rejected, not the entire bid quantity. Bid quantities that have been rejected will not be considered in determining the settlement price. “Qualified bids” are the bids that remain after the submitted bids have been evaluated and reduced to meet all limits.

Determination of qualified bids occurs after the bidding window has been closed and before the settlement price is determined. The process is the same for the Current Auction and the Advance Auction. The result is a set of qualified bids from which the settlement price is determined for both the Current Auction and the Advance Auction.

Table 2 shows bid evaluation data for a sample Current Auction where 1,000,000 allowances are available. These data will be used in the examples below to demonstrate how the Auction Administrator will evaluate each participant’s bids submitted for the Current Auction. In some cases, a bid may exceed more than one evaluation criterion (i.e. purchase limit, holding limit or bid guarantee value). When a bid is limited by more than one criterion, the bid will be reduced in lots of 1,000 allowances to the most limiting constraint.

Table 2: Sample Bid Evaluation Data

Participant Name	Participant Type	Purchase Limit (Number of Allowances)	Holding Limit (Number of Allowances)²	Bid Guarantee
A	Capped Participant	250,000	5,433,300	\$3,913,440
B	Capped Participant	250,000	5,433,300	\$3,366,120
C	Capped Participant	250,000	5,433,300	\$7,688,400
D	Capped Participant	250,000	5,433,300	\$3,947,760
E	Capped Participant	250,000	5,433,300	\$4,039,680
F	Capped Participant	250,000	5,433,300	\$3,092,880
G	Market Participant	40,000	5,433,300	\$3,947,760

Purchase limits in the examples throughout this document are based on the percentages assigned to each participant type as described previously.

In the sample bid evaluation data in Table 2, the bid guarantees represent the bid guarantees submitted. In some cases, the bid guarantee is different from the maximum total value of a participant’s bid schedule shown in Table 1. This has been done to demonstrate how the bid guarantee criteria impacts bids if the bid guarantee is less than the bid value at a specific bid price and how the bid guarantee is used in the Advance Auction.

A. Purchase Limit Evaluation

Example 5 below illustrates how the Auction Administrator evaluates a participant’s set of bids against the participant’s auction purchase limit.

Example 5: Purchase Limit Evaluation by Comparison of Sample Bid Schedules in Table 1 against the Sample Bid Evaluation Data Criteria in Table 2.

Table 3 below compares participant purchase limits from Table 2 with each participant’s

² This column denotes the number of allowances that can be purchased within the current vintage holding limit. It is assumed that the general holding account balance is zero and that allowances in the compliance account are exactly equal to the limited exemption.

cumulative bid allowances from Table 1.

Table 3: Purchase Limit Evaluation for Example 5

Participant Name	Maximum Cumulative Bid Allowances	Purchase Limit	Purchase Limit Evaluation
A	250,000	250,000	OK
B	250,000	250,000	OK
C	165,000	250,000	OK
D	170,000	250,000	OK
E	265,000	250,000	Limit Exceeded
F	200,000	250,000	OK
G	170,000	40,000	Limit Exceeded

Participants E and G submitted bids that exceed their purchase limits.

Participant E: Participant E’s bids are not within its purchase limit as the cumulative total of its bids, 265,000 allowances, exceeds the purchase limit of 250,000 allowances for Capped Participants. As a result, Participant E’s submitted bids that contain bid quantities in excess of the purchase limit will be rejected in lots of 1,000 allowances until the purchase limit is met. Thus, only the portion of the bid that exceeds the limit will be rejected, not the entire bid. In Table 1, Participant E’s first three bids sum to 155,000 allowances. It can purchase no more than an additional 95,000 allowances (250,000 - 155,000). Thus, Participant E’s fourth bid would be limited to 95,000 allowances.

Participant G: Participant G’s bids are not within its purchase limit as the cumulative total of its bids, 170,000 allowances, exceeds the purchase limit of 40,000 allowances for Market Participants. Submitted bids that contain bid quantities in excess of the purchase limit will be rejected in lots of 1,000 allowances until the purchase limit is met. Thus, only the portion of the bid that exceeds the limit will be rejected, not the entire bid. Participant G’s first bid is for 50,000 allowances. Thus, participant G’s first bid would be limited to 40,000 allowances and the second bid would be rejected.

B. Holding Limit Evaluation

In Example 6, the available space within a participant’s holding limit is defined as the maximum number of allowances that can be purchased by a participant at the auction while in compliance with the holding limit. This is described in the Detailed Auction Requirements and Instructions

document as the holding limit cap that the jurisdictions transmit to the Auction Administrator prior to the auction. Denoted as ‘Holding Limit’ in Table 2, the holding limit cap indicates how many allowances an auction participant may acquire before exceeding their holding limit.

Example 6: Holding Limit Evaluation by Comparison of Bids in Table 1 against the Sample Bid Evaluation Data in Table 2.

In this example, and assuming all participants have no holdings of current or prior vintage allowances in their general holding accounts, all the bids submitted by participants are within their current vintage holding limit; no participant has bid for more than 5,433,300 cumulative allowances.

C. Bid Guarantee Evaluation

The Regulation requires the amount of the bid guarantee to be greater than or equal to the maximum value of the bids to be submitted. Prior to auction settlement, the Auction Administrator will evaluate the submitted bid guarantee for each participant for the Current Auction. As a participant provides a single bid guarantee, any funds remaining once the Current Auction settlement price has been determined, and the cost of allowances awarded in the Current Auction has been deducted, will be applied to any bids submitted by the participant in the Advance Auction. The settlement price algorithm is structured to recognize that a bid that is limited by the bid guarantee at a submitted bid price may not be limited as much or limited at all at lower potential settlement prices. If a bid quantity is limited by the bid guarantee at the submitted bid price, but could be fulfilled if the settlement price is lower than the submitted bid price, the participant will be awarded allowances up to the bid quantity and the limits of the bid guarantee.

Table 4 below compares participant bid guarantees from Table 2 with each participant’s maximum bid value based on Participant Cumulative Bid Value from Table 1.

Table 4: Bid Guarantee Evaluation for Example 7

Participant Name	Maximum Bid Value	Bid Guarantee	Bid Guarantee Evaluation
A	\$3,912,500	\$3,913,440	OK
B	\$3,825,000	\$3,366,120	Insufficient
C	\$6,147,500	\$7,688,400	OK
D	\$3,947,400	\$3,947,760	OK
E	\$4,049,200	\$4,039,680	Insufficient
F	\$3,056,000	\$3,092,880	OK
G	\$3,947,400	\$3,947,760	OK

Example 7: Bid Guarantee Evaluation

Participants B and E submitted bids for which their bid guarantee is insufficient. Refer to these Participants' bid details in Table 1 to follow the explanations below:

Participant B: Participant B's bid guarantee of \$3,366,120 is not sufficient to cover its maximum bid value of \$3,825,000. The Auction Administrator would reduce Participant B's second bid to 140,000 allowances. At the bid price of \$15.30, a total of 220,000 allowances can be purchased with the submitted bid guarantee ($\$3,366,120 / \$15.30 = 220,007$, rounded down to 220,000). The total number of allowances that can be purchased through the second bid is 140,000 ($220,000 - 80,000$). Thus, Participant B's second bid would be limited to 140 bid lots based on the bid guarantee limitation.

Participant E: Participant E's bid guarantee of \$4,039,680 is not sufficient to cover its maximum bid value of \$4,049,200. At the bid price of \$15.28, the Auction Administrator would reduce Participant E's fourth bid to 109,000 allowances. A total of 264,376 allowances can be purchased with the submitted bid guarantee ($\$4,039,680 / 15.28 = 264,376$). Rounded down to nearest bid lot, the total number of allowances that can be purchased through the fourth bid is 109,000 ($264,000 - 155,000$). Thus, Participant E's fourth bid would be limited to 109 bid lots based on the bid guarantee limitation.

However, Participant E's fourth bid is limited by both the purchase limit and its bid guarantee. When a bid is limited by more than one criterion, the bid will be reduced in lots of 1,000 allowances to the most limiting constraint. A reduction of the fourth bid to 109,000

allowances would meet the bid guarantee limit but not the purchase limit. The fourth bid would be reduced to 95,000 allowances to meet both limitations. The bid must pass all evaluations to be qualified and in this example, the most limiting criterion is the purchase limit. Therefore, Participant E's qualified fourth bid is 95 bid lots.

Participant G: Participant G's bid guarantee of \$3,947,760 is sufficient to cover its maximum bid value of \$3,947,400. However, the bids submitted exceed the purchase limit and thus the first bid is reduced to 40,000, and the second bid is rejected.

Table 5 shows the qualified bids after the Auction Administrator has completed the bid evaluation process, with the reduced bid quantities shaded in grey and the rejected bid shaded in dark grey. These are the bids that would be used in calculating the settlement price. Please note that the cumulative allowances and bid values are also adjusted to reflect reduced bid quantities where applicable.

Table 5: Bids Accepted by Auction Administrator (for Example 7)

Participant Name	Bid Price	Submitted Bid Lots	Qualified Bid Allowances	Participant Cumulative Qualified Bid Allowances	Participant Cumulative Qualified Bid Value
A	\$28.64	40	40,000	40,000	\$1,145,600
A	\$23.29	55	55,000	95,000	\$2,212,550
A	\$19.48	70	70,000	165,000	\$3,214,200
A	\$15.65	85	85,000	250,000	\$3,912,500
B	\$21.35	80	80,000	80,000	\$1,708,000
B	\$15.30	170	140,000	220,000	\$3,366,000
C	\$54.35	25	25,000	25,000	\$1,358,750
C	\$49.18	100	100,000	125,000	\$6,147,500
C	\$35.80	40	40,000	165,000	\$5,907,000
D	\$27.19	50	50,000	50,000	\$1,359,500
D	\$23.22	120	120,000	170,000	\$3,947,400
E	\$24.90	35	35,000	35,000	\$871,500
E	\$22.15	50	50,000	85,000	\$1,882,750
E	\$19.48	70	70,000	155,000	\$3,019,400
E	\$15.28	110	95,000	250,000	\$3,820,000
F	\$15.28	200	200,000	200,000	\$3,056,000
G	\$24.90	50	40,000	40,000	\$996,000
G	\$23.22	120	0	40,000	\$928,800

VI. SETTLEMENT PRICE DETERMINATION PROCEDURES

The process to determine the settlement price requires that the Auction Administrator rank qualified bids from all participants from highest to lowest.³ Allowances will be awarded to participants, beginning with the highest qualified bid price and moving to successively lower qualified bid prices, until the entire supply of allowances is exhausted or all qualified bids have been filled. Each bid will be assessed against purchase and holding limits and the value of the bid guarantee as described in the previous section. The bid price at which all available allowances are sold or all qualified bids are filled becomes the settlement price. This is the price per allowance that all participants will be charged for the allowances awarded in the auction. Bids submitted at prices below the settlement price will not be awarded any allowances.

In determining the settlement price, the Auction Administrator may find that the quantity of allowances bid for at a specific price exceeds the remaining allowances available for sale. When this occurs, a tiebreaker procedure is used to determine the number of allowances awarded to each participant.

This section provides three examples of the calculation of the settlement price. Example 8 shows the sale of all available allowances with the last winning bid completely exhausting the available allowances.

Example 8: Settlement Price When the Last Winning Bid Exhausts the Available Allowances

This example is for bids submitted in the Current Auction. (The process for determining the settlement price is the same for the Current and Advance Auctions.) Qualified bids from Participants A to G in the bid evaluation process provided in Table 3 are used in this settlement price example. For this example, the quantity of allowances available for sale is 1,000,000.

All qualified bids submitted by all participants are ranked from the highest qualified bid price to the lowest qualified bid price. In Table 6, the 5th column (Auction Cumulative Qualified Bid Allowances) shows the cumulative number of allowances for all participants at each declining bid price increment. The 6th column (Allowance Supply Remaining) shows

³ The process for determining the settlement price is the same for the Current and Advance Auctions, although bid guarantee available, purchase limits and holding limits would likely be different.

allowances remaining to be sold, which is the difference between the allowance supply of 1,000,000 and the Cumulative Qualified Bid Allowances in the 5th column.

Table 6: Auction Settlement Price Determination for Example 8

Participant Name	Bid Price	Submitted Bid Lots	Qualified Bid Allowances	Auction Cumulative Qualified Bid Allowances	Allowance Supply Remaining
C	\$54.35	25	25,000	25,000	975,000
C	\$49.18	100	100,000	125,000	875,000
C	\$35.80	40	40,000	165,000	835,000
A	\$28.64	40	40,000	205,000	795,000
D	\$27.19	50	50,000	255,000	745,000
E	\$24.90	35	35,000	290,000	710,000
G	\$24.90	50	40,000	330,000	670,000
A	\$23.29	55	55,000	385,000	615,000
D	\$23.22	120	120,000	505,000	495,000
G	\$23.22	120	0	505,000	495,000
E	\$22.15	50	50,000	555,000	445,000
B	\$21.35	80	80,000	635,000	365,000
A	\$19.48	70	70,000	705,000	295,000
E	\$19.48	70	70,000	775,000	225,000
A	\$15.65	85	85,000	860,000	140,000
B	\$15.30	170	140,000	1,000,000	0
E	\$15.28	110	95,000	1,095,000	0
F	\$15.28	200	200,000	1,295,000	0

At the highest bid price of \$54.35, only 25,000 allowances have been sold and 975,000 allowances remain to be sold. At the next lower bid price, \$49.18, a total of 125,000

allowances have been sold and 875,000 allowances remain. Continuing down the 6th column, at the bid price of \$15.30, the entire available supply of allowances is sold and qualified bids at prices below \$15.30 cannot be filled. Hence, the settlement price is \$15.30 (shaded in grey in Table 6) and 1,000,000 allowances are sold at a total bid cost of \$15,300,000.

Allowances won by each participant and their respective total bid cost are shown in Table 7 below. Participant A would win 250,000 allowances from its four bids, and its total bid cost is \$3,825,000 (250,000 * \$15.30).

Table 7: Allowances Won and Total Costs for Example 8

Participant Name	Allowances Won	Total Cost
A	250,000	\$3,825,000
B	220,000	\$3,366,000
C	165,000	\$2,524,500
D	170,000	\$2,601,000
E	155,000	\$2,371,500
F	0	\$0
G	40,000	\$612,000
Total	1,000,000	\$15,300,000

A. Settlement Determination with Bid Guarantee Limitation

The settlement price algorithm is structured to recognize that a bid that is limited by the bid guarantee at a submitted bid price may not be limited as much or limited at all at other potential settlement prices. If a bid quantity is limited by the bid guarantee at the submitted bid price, but could be fulfilled if the settlement price is lower than the submitted bid price, the participant will be awarded allowances up to the bid quantity and the limits of the bid guarantee. However, the settlement price algorithm will not award the participant more allowances than they bid for.

Example 9 shows the settlement price determination when a participant's bid schedule is limited by the participant's submitted bid guarantee.

Example 9: Settlement Price Determination When a Participant’s Bid Schedule is Limited by the Participant’s Submitted Bid Guarantee

This example uses the same bid submissions as the previous example; however the quantity of allowances is increased to 1,060,000. The larger supply of allowances increases participant purchase limits as shown in Table 8 below. Bid guarantees for purposes of this example are also shown in Table 8; note that the bid guarantee for Participant F has been revised.

Table 8: Sample Bid Evaluation Data for Example 9

Participant Name	Purchase Limit (Number of Allowances)	Holding Limit (Number of Allowances)	Bid Guarantee
A	265,000	5,433,300	\$3,913,440
B	265,000	5,433,300	\$3,366,120
C	265,000	5,433,300	\$7,688,400
D	265,000	5,433,300	\$3,947,760
E	265,000	5,433,300	\$4,039,680
F	265,000	5,433,300	\$10,000
G	42,400	5,433,300	\$3,947,760

Table 9 below compares participant bid guarantees and purchase limits from Table 8 with each participant’s maximum bid value and maximum cumulative bid allowances from Table 1.

Table 9: Bid Guarantee and Purchase Limit Evaluation for Example 9

Participant Name	Maximum Total Bid Value	Bid Guarantee	Bid Guarantee Evaluation	Participant Cumulative Bid Allowances	Purchase Limit	Purchase Limit Evaluation
A	\$3,912,500	\$3,913,440	OK	250,000	265,000	OK
B	\$3,825,000	\$3,366,120	Insufficient	250,000	265,000	OK
C	\$6,147,500	\$7,688,400	OK	165,000	265,000	OK
D	\$3,947,400	\$3,947,760	OK	170,000	265,000	OK
E	\$4,049,200	\$4,039,680	Insufficient	265,000	265,000	OK
F	\$3,056,000	\$10,000	Insufficient	200,000	265,000	OK
G	\$3,947,400	\$3,947,760	OK	170,000	42,400	Limit Exceeded

Participants B, E, F and G submitted bids for which their bid guarantee is insufficient or that exceeded their purchase limit.

Participant B: Participant B's bids are within the purchase limit. However, Participant B's second bid exceeds the submitted bid guarantee and is limited to 140,000 allowances.

Participant E: Participant E's bids are within the purchase limit. However, Participant E's fourth bid exceeds the submitted bid guarantee and is limited to 109,000 allowances.

Participant F: Participant F's bids are within the purchase limit. However, Participant F's bid exceeds the submitted bid guarantee and is limited to zero allowances.

Participant G: Participant G's first bid exceeds the purchase limit and is limited to 42,000 allowances, while Participant G's second bid is rejected. Participant G's bids are within the bid guarantee.

Table 10 shows the calculation of the settlement price determination with a participant's bids limited by the bid guarantee limitation in an auction with 1,060,000 allowances for sale. In this example, the settlement price is \$15.28.

Table 10: Auction Settlement Price Determination with a Bid Guarantee Limit for Example 9

Participant Name	Bid Price	Qualified Bid Lots	Qualified Bid Allowances	Auction Cumulative Qualified Bid Allowances	Allowance Supply Remaining
C	\$54.35	25	25,000	25,000	1,035,000
C	\$49.18	100	100,000	125,000	935,000
C	\$35.80	40	40,000	165,000	895,000
A	\$28.64	40	40,000	205,000	855,000
D	\$27.19	50	50,000	255,000	805,000
E	\$24.90	35	35,000	290,000	770,000
G	\$24.90	42	42,000	332,000	728,000
A	\$23.29	55	55,000	387,000	673,000
D	\$23.22	120	120,000	507,000	553,000
G	\$23.22	0	0	507,000	553,000
E	\$22.15	50	50,000	557,000	503,000
B	\$21.35	80	80,000	637,000	423,000
A	\$19.48	70	70,000	707,000	353,000
E	\$19.48	70	70,000	777,000	283,000
A	\$15.65	85	85,000	862,000	198,000
B	\$15.30	140	140,000	1,002,000	58,000
E	\$15.28	109	109,000	1,111,000	0
F	\$15.28	0	0	1,111,000	0

Since there are only 58,000 allowances remaining to be sold after Participant B's last bid was awarded, Participant E's bid at \$15.28 would be awarded a total of 58,000 allowances, the total allowance supply remaining.

For a Current Auction allowance supply of 1,060,000 allowances, the allowances won by each participant and their respective total bid cost are shown in Table 11.

Table 11: Allowances Won and Total Cost for Example 9

Participant Name	Allowances Won	Total Cost
A	250,000	\$3,820,000
B	220,000	\$3,361,600
C	165,000	\$2,521,200
D	170,000	\$2,597,600
E	213,000	\$3,254,640
F	0	\$0
G	42,000	\$641,760
Total	1,060,000	\$16,196,800

B. Settlement Determination with Tiebreaker Procedure

Section 75 (4) of the Regulation specifies that the tiebreaker procedure be used when the sum of multiple participants' bid quantities at the settlement price exceeds the remaining allowances available for sale. During the tiebreaker procedure, each participant that has submitted qualified bids at or above the settlement price will be awarded allowances based on its share of qualified bids at the settlement price. A participant with a bid guarantee limited qualified bid will be included in the tiebreaker if it can purchase additional allowances at the settlement price.

Each participant is awarded allowances based on its share of qualified bids at the settlement price times the number of allowances remaining to be sold, rounded down to the nearest whole allowance. If there are allowances remaining as a result of rounding down, those allowances are awarded to participants by assigning a random number to each participant. The remaining allowances are awarded to participants starting with the lowest assigned random number and proceeding to the next higher random number until all remaining allowances are awarded. Under the tiebreaker procedure, allowances sold to participants in the tiebreaker may not be in lots of 1,000 allowances.

Example 10 illustrates the tiebreaker procedure.

Example 10: Tiebreaker Example

This example uses the same bid submissions as used in Examples 8 and 9. The quantity of allowances available for sale for this example is 850,000. The bid evaluation data for this example including bid guarantee amount, purchase limit and holding limit for each participant is provided in Table 12; note that the bid guarantee for Participant B has been revised and Participant F's bid guarantee has been returned to its original value.

Table 12: Sample Bid Evaluation Data for Example 10

Participant Name	Purchase Limit (Number of Allowances)	Holding Limit (Number of Allowances)	Bid Guarantee
A	212,500	5,433,300	\$3,261,200
B	212,500	5,433,300	\$1,018,500
C	212,500	5,433,300	\$6,407,000
D	212,500	5,433,300	\$3,289,800
E	212,500	5,433,300	\$3,366,400
F	212,500	5,433,300	\$2,577,400
G	34,000	5,433,300	\$3,289,800

Table 13 below compares participant bid guarantees and purchase limits from Table 12 with each participant's maximum bid value and participant cumulative bid allowances from Table 1.

Table 13: Bid Guarantee and Purchase Limit Evaluation for Example 10

Participant Name	Maximum Total Bid Value	Bid Guarantee	Bid Guarantee Evaluation	Participant Cumulative Bid Allowances	Purchase Limit	Purchase Limit Evaluation
A	\$3,912,500	\$3,913,440	OK	250,000	212,500	Limit Exceeded
B	\$3,825,000	\$1,222,500	Insufficient	250,000	212,500	Limit Exceeded
C	\$6,147,500	\$7,688,400	OK	165,000	212,500	OK
D	\$3,947,400	\$3,947,760	OK	170,000	212,500	OK
E	\$4,049,200	\$4,039,680	Insufficient	265,000	212,500	Limit Exceeded
F	\$3,056,000	\$3,092,000	OK	200,000	212,500	OK
G	\$3,947,400	\$3,947,760	OK	170,000	34,000	Limit Exceeded

Participants A, B, E, and G submitted bids for which their bid guarantee is insufficient or that exceeded their purchase limit.

Participant A: Participant A’s fourth bid exceeds its purchase limit and is limited to 47,000 allowances (47 bid lots). Participant A’s bids are within its bid guarantee.

Participant B: Participant B’s second bid exceeds the purchase limit and is limited to 132,000 allowances (132 bid lots). However, Participant B’s qualified bid(s) is determined by its bid guarantee. Participant B’s first bid also exceeds the submitted bid guarantee. Participant B’s first bid would be limited to 57,000 allowances (57 bid lots) at the bid price of \$21.35 ($\$1,222,500 / 21.35 = 57,259$, rounded down to 57,000 allowances). As the settlement price algorithm is structured to recognize that Participant B’s bids may not be limited as much at other settlement prices, Participant B’s second bid at \$15.30 is evaluated to determine if it can purchase any additional allowances (but no more than 250,000 total), given its bid guarantee. At \$15.30, Participant B’s bid guarantee is large enough to purchase 79,000 allowances ($\$1,222,500 / \$15.30 = 79,901$). Participant B’s qualified second bid is 22,000 allowances (79,000 – 57,000), and this is less than the purchase limited qualified bid of 132,000 allowances. Participant B will be awarded allowances up to the bid quantity and the limits of its bid guarantee at the settlement price. If the settlement price is 15.28, Participant B can

purchase an additional 1,000 allowances ($\$1,222,500/15.28 = 80,006$). Table 14 below shows Participant B has a bid for 1 bid lot at \$15.28, shaded in grey. This is not a bid that is in Participant B's bid schedule but represents the additional qualified bid allowances that Participant B can purchase at the settlement price of \$15.28. Participant B's qualified bid of 79,000 allowances at \$15.30 is awarded in the settlement process; however, at the price of \$15.28, Participant B can purchase an additional 1,000 allowances and is part of the tiebreaker with Participant E and Participant F.

Participant E: Participant E's fourth bid exceeds the purchase limit and is limited to 57,000 allowances. However, Participant E's fourth bid also exceeds the submitted bid guarantee and is limited to 109,000 allowances. As Participant E's bids must conform to both the bid guarantee and the purchase limit, Participant E's fourth bid is limited to 57,000 allowances (57 bid lots).

Participant G: Participant G's first bid exceeds the purchase limit and will be limited to 34,000 allowances, and Participant G's second bid is rejected for the same reason. Participant G's bids are within the bid guarantee.

Table 14 shows the determination of the settlement price for the allowance supply of 850,000 allowances. Again, bids from all participants are ranked from highest bid price to lowest bid price. At \$15.30, there are 35,000 allowances remaining to be sold; but at the next bid price of \$15.28, Participants B, E and F have combined qualified bids for 258,000 allowances. For this Current Auction, the settlement price is \$15.28 where all 850,000 allowances are sold. The Auction Administrator must implement the tiebreaker procedure to determine allowances won by Participants B, E, and F at the settlement price.

Table 14: Settlement Price Determination with a Tiebreaker for Example 10

Participant Name	Bid Price	Qualified Bid Lots	Qualified Bid Allowances	Auction Cumulative Qualified Bid Allowances	Allowance Supply Remaining
C	\$54.35	25	25,000	25,000	825,000
C	\$49.18	100	100,000	125,000	725,000
C	\$35.80	40	40,000	165,000	685,000
A	\$28.64	40	40,000	205,000	645,000
D	\$27.19	50	50,000	255,000	595,000
E	\$24.90	35	35,000	290,000	560,000
G	\$24.90	34	34,000	324,000	526,000
A	\$23.29	55	55,000	379,000	471,000
D	\$23.22	120	120,000	499,000	351,000
G	\$23.22	0	0	499,000	351,000
E	\$22.15	50	50,000	549,000	301,000
B	\$21.35	57	57,000	606,000	244,000
A	\$19.48	70	70,000	676,000	174,000
E	\$19.48	70	70,000	746,000	104,000
A	\$15.65	47	47,000	793,000	57,000
B	\$15.30	22	22,000	815,000	35,000
E	\$15.28	57	57,000	872,000	0
F	\$15.28	200	200,000	1,072,000	0
B	\$15.28	1	1,000	1,073,000	0

Participants B, E and F have qualified bid allowances totaling 258,000 at the bid price of \$15.28. Participant shares of the 258,000 allowances bid are determined and Participants are

sold allowances, from the 35,000 remaining, according to their shares, with allowance amounts rounded down. Total allowances sold based on shares may be less than 35,000; the remaining allowances are sold based on random number assignments to participants, lowest random number first.

Participants B, E and F's shares are calculated as follows:

Participant B's share is 0.003875969 ($1,000 / 258,000 = 0.003875969$).

Participant E's share is 0.2209302326 ($57,000 / 258,000 = 0.2209302326$).

Participant F's share is 0.7751937984 ($200,000 / 258,000 = 0.7751937984$).

Allowances awarded to Participants B, E and F according to their shares are as follows:

Participant B would be awarded 135 allowances ($0.003875969 * 35,000$).

Participant E would be awarded 7,732 allowances ($0.2209302326 * 35,000$).

Participant F would be awarded 27,131 allowances ($0.775193798 * 35,000$).

The total number of allowances awarded through this process is 34,998; two allowances remain to be awarded to the participants with the two lowest random numbers. If participant B is assigned a random number of 5, participant E is assigned a random number of 200, and participant F is assigned a random number of 77, one allowance is awarded to participant B and one allowance is awarded to participant F.

While participant B could have purchased up to 80,000 allowances at the settlement price of \$15.28, due to the tiebreaker process participant B is awarded a total of 79,136 allowances ($57,000 + 22,000 + 135 + 1$).

Allowances won in the tiebreaker are added to allowances won at higher bid prices. For example, participant E's total allowances are 162,732 ($35,000 + 50,000 + 70,000 + 7,732$).

Allowances won by each participant and their respective total bid cost are shown in Table 15.

Table 15: Allowances Won and Total Cost for Example 10

Participant Name	Allowances Won	Total Cost
A	212,000	\$3,239,360
B	79,136	\$1,209,198
C	165,000	\$2,521,200
D	170,000	\$2,597,600
E	162,732	\$2,486,545
F	27,132	\$414,577
G	34,000	\$519,520
Total	850,000	\$12,988,000

VII. BID EVALUATION IN ADVANCE AUCTION

As previously described in the bid evaluation examples provided in this document, the assumption is that bids were submitted for a Current Auction. The bid evaluation process for an Advance Auction is the same, although the bid guarantee available, purchase limits and holding limits would be different.

Participants submit a single bid guarantee for both the Current Auction and Advance Auction. As shown in Example 2, once the Current Auction settlement price has been determined, the participant's total cost for allowances awarded in the Current Auction (settlement price multiplied by number of allowances awarded) will be determined and deducted from the bid guarantee amount, and any bid guarantee amount remaining will be applied to the Advance Auction.

Disclaimer: Both the Detailed Auction Requirements and Instructions and the Auction Examples should be read in conjunction with the *Climate Change Mitigation and Low-carbon Economy Act, 2016* and O.Reg. 144/16. A registered participant who is seeking to participate or who is participating in an auction should refer to the Act and the Regulation along with these two documents. Where there is a discrepancy between what is contained in these documents and the Act or Regulation, the Act or Regulation will prevail. If you have any questions about the application or interpretation of the Act or Regulation or have other legal questions, you should consult a lawyer.