

Decrement formulas for the BGS-CIEP Auction

January 23, 2019

As noted in Section VIII.C.8 of the Final BGS-CIEP Auction Rules (dated December 12, 2018), the formulas that will be used in the BGS-CIEP Auction are released to all bidders no later than three days after bidder registration. These decrement formulas, which depend on the number of registered bidders, are provided below.

VIII.G.2 Decrements

The calculation of the size of the decrement, Δ , is based on the oversupply ratio, γ , which is the ratio of the excess supply on an EDC to an estimate of the maximum excess supply:

$$\gamma = \frac{B - TT}{\min(\overline{RES}, n \cdot \min\{SWLC, TT\} - TT)}$$

The numerator is the excess supply on an EDC, which is the number of tranches bid at the going price (B) minus the tranche target (TT). The denominator is a measure of maximum possible excess supply. The excess supply on an EDC must be less than or equal to the total excess supply in the Auction. \overline{RES} is the upper bound of the range of total excess supply reported to bidders and serves as a measure of total excess supply in the Auction. The excess supply on an EDC must also be less than or equal to the excess supply that would result from all bidders bidding the maximum possible number of tranches on the EDC. The maximum possible number of tranches that can be bid on an EDC is either the statewide load cap ($SWLC$) or the tranche target (TT), whichever is lower. Thus, the excess supply that would result from all bidders bidding the maximum possible number of tranches on the EDC would be $n \cdot \min\{SWLC, TT\} - TT$ tranches, namely the number of registered bidders (n) times the statewide load cap ($SWLC$) or the tranche target (TT), minus the tranche target (to get a measure of excess supply). The estimate of maximum possible excess supply for the EDC used for the decrement rule is \overline{RES} , or the measure based on the number of registered bidders and the load cap ($n \cdot \min\{SWLC, TT\} - TT$), whichever is smaller.

Regime 1

The Auction starts in Regime 1. In Regime 1, the following decrement formulas will be used.

If an EDC's tranche target is 20 tranches or more, the decrement for that EDC is set as a series of steps. Using this rule, the smallest decrement would be 0.5% (and the amount of the decrease in price would be rounded off to the nearest cent). The smallest decrement would be in effect when the oversupply ratio is at or below a pre-determined value (but above 0). The decrement is never more than 5% (subject to rounding off). The largest decrement would be in effect when the oversupply ratio is above that pre-determined maximum value.

The following series of steps will be used:

$$\Delta = \begin{cases} 0.0050 & \text{if } \gamma \leq 0.11 \\ 0.0175 & \text{if } 0.11 < \gamma \leq 0.28 \\ 0.0300 & \text{if } 0.28 < \gamma \leq 0.44 \\ 0.0400 & \text{if } 0.44 < \gamma \leq 0.60 \\ 0.0500 & \text{if } \gamma > 0.60 \end{cases}$$

When the oversupply ratio is at or below a value of 0.1100 (but above 0), the decrement is set at 0.50%. When the oversupply ratio is at or below a value of 0.2800 (but above 0.1100), the decrement is set at 1.75%. When the oversupply ratio is at or below a value of 0.4400 (but above 0.2800), the decrement is set at 3%. When the oversupply ratio is at or below a value of 0.6000 (but above 0.4400), the decrement is set at 4%. When the oversupply ratio is above 0.6000, which means that the excess supply on the EDC exceeds 60.00% of its maximum, the decrement is set at 5%.

If an EDC's tranche target is between 10 and 19 tranches (inclusive), the decrement for that EDC is set as a series of steps. Using this rule, the smallest decrement would be 0.5% (and the amount of the decrease in price would be rounded off to the nearest cent). The smallest decrement would be in effect when the oversupply ratio is at or below a pre-determined value (but above 0). The decrement is never more than 5% (subject to rounding off). The largest decrement would be in effect when the oversupply ratio is above that pre-determined maximum value.

The following series of steps will be used:

$$\Delta = \begin{cases} 0.0050 & \text{if } \gamma \leq 0.11 \\ 0.0175 & \text{if } 0.11 < \gamma \leq 0.28 \\ 0.0300 & \text{if } 0.28 < \gamma \leq 0.44 \\ 0.0400 & \text{if } 0.44 < \gamma \leq 0.60 \\ 0.0500 & \text{if } \gamma > 0.60 \end{cases}$$

When the oversupply ratio is at or below a value of 0.1100 (but above 0), the decrement is set at 0.50%. When the oversupply ratio is at or below a value of 0.2800 (but above 0.1100), the decrement is set at 1.75%. When the oversupply ratio is at or below a value of 0.4400 (but above 0.2800), the decrement is set at 3%. When the oversupply ratio is at or below a value of 0.6000 (but above 0.4400), the decrement is set at 4%. When the oversupply ratio is above 0.6000, which means that the excess supply on the EDC exceeds 60.00% of its maximum, the decrement is set at 5%.

If an EDC's tranche target is between 3 tranches and 9 tranches (inclusive), the decrement for that EDC is set as a series of steps. Using this rule, the smallest decrement would be 1.75% (and the amount of the decrease in price would be rounded off to the nearest cent). The smallest decrement would be in effect when the oversupply ratio is at or below a pre-determined value (but above 0). The decrement is never more than 5% (subject to rounding off). The largest decrement would be in effect when the oversupply ratio is above that pre-determined maximum value.

The following series of steps will be used:

$$\Delta = \begin{cases} 0.0175 & \text{if } \gamma \leq 0.22 \\ 0.03 & \text{if } 0.22 < \gamma \leq 0.44 \\ 0.05 & \text{if } \gamma > 0.44 \end{cases}$$

When the oversupply ratio is at or below a value of 0.2200 (but above 0), the decrement is set at 1.75%. When the oversupply ratio is at or below a value of 0.4400 (but above 0.2200), the decrement is set at 3%. When the oversupply ratio is above 0.4400, which means that the excess supply on the EDC exceeds 44.00% of its maximum, the decrement is set at 5%.

If an EDC's tranche target is 2 tranches or fewer, the decrement for that EDC is set as a series of steps. Using this rule, the smallest decrement would be 3% (and the amount of the decrease in price would be rounded off to the nearest cent). The smallest decrement would be in effect when the oversupply ratio is at or below a pre-determined value (but above 0). The decrement is never more than 5% (subject to rounding off). The largest decrement would be in effect when the oversupply ratio is above that pre-determined maximum value.

The following series of steps will be used:

$$\Delta = \begin{cases} 0.03 & \text{if } \gamma \leq 0.20 \\ 0.05 & \text{if } \gamma > 0.20 \end{cases}$$

When the oversupply ratio is at or below a value of 0.2000 (but above 0), the decrement is set at 3%. When the oversupply ratio is above 0.2000, which means that the excess supply on the EDC exceeds 20.00% of its maximum, the decrement is set at 5%.

Change from Regime 1 to 2

Decrements continue to be calculated by the decrement formulas of Regime 1 until the going prices for round 4 are calculated. After that time, in the first round in which the upper bound of the total excess supply range (\overline{RES}) reported to bidders is

- Greater than 20 tranches; and
- At least 10 tranches fewer than the upper bound of the total excess supply range reported to bidders in round 1;

then the decrement formulas of Regime 2 will be used for the going prices in the next round. If, in the first round in which \overline{RES} is at least 10 tranches fewer than \overline{RES} in round 1, it is also the case that the upper bound of the total excess supply range reported to bidders is 20 tranches, the decrement formulas of Regime 3 will be used for the going prices in the next round and for the remainder of the Auction.

Regime 2

In Regime 2, the following decrement formulas will be used.

If an EDC's tranche target is 20 tranches or more, the decrement for that EDC is set as a series of steps. Using this rule, the smallest decrement would be 0.375% (and the amount of the decrease in price would be rounded off to the nearest cent). The smallest decrement would be in effect when the oversupply ratio is at or below a pre-determined value (but above 0). The decrement is never more than 3.75% (subject to rounding off). The largest decrement would be in effect when the oversupply ratio is above that pre-determined maximum value.

The following series of steps will be used:

$$\Delta = \begin{cases} 0.00375 & \text{if } \gamma \leq 0.11 \\ 0.01250 & \text{if } 0.11 < \gamma \leq 0.28 \\ 0.02250 & \text{if } 0.28 < \gamma \leq 0.44 \\ 0.03000 & \text{if } 0.44 < \gamma \leq 0.60 \\ 0.03750 & \text{if } \gamma > 0.60 \end{cases}$$

When the oversupply ratio is at or below a value of 0.1100 (but above 0), the decrement is set at 0.375%. When the oversupply ratio is at or below a value of 0.2800 (but above 0.1100), the decrement is set at 1.25%. When the oversupply ratio is at or below a value of 0.4400 (but above 0.2800), the decrement is set at 2.25%. When the oversupply ratio is at or below a value of 0.6000 (but above 0.4400), the decrement is set at 3%. When the oversupply ratio is above 0.6000, which means that the excess supply on the EDC exceeds 60.00% of its maximum, the decrement is set at 3.75%.

If an EDC's tranche target is between 10 and 19 tranches (inclusive), the decrement for that EDC is set as a series of steps. Using this rule, the smallest decrement would be 0.375% (and the amount of the decrease in price would be rounded off to the nearest cent). The smallest decrement would be in effect when the oversupply ratio is at or below a pre-determined value (but above 0). The decrement is never more than 3.75% (subject to rounding off). The largest decrement would be in effect when the oversupply ratio is above that pre-determined maximum value.

The following series of steps will be used:

$$\Delta = \begin{cases} 0.00375 & \text{if } \gamma \leq 0.11 \\ 0.01250 & \text{if } 0.11 < \gamma \leq 0.28 \\ 0.02250 & \text{if } 0.28 < \gamma \leq 0.44 \\ 0.03000 & \text{if } 0.44 < \gamma \leq 0.60 \\ 0.03750 & \text{if } \gamma > 0.60 \end{cases}$$

When the oversupply ratio is at or below a value of 0.1100 (but above 0), the decrement is set at 0.375%. When the oversupply ratio is at or below a value of 0.2800 (but above 0.1100), the decrement is set at 1.25%. When the oversupply ratio is at or below a value of 0.4400 (but above 0.2800), the decrement is set at 2.25%. When the oversupply ratio is at or below a value of 0.6000 (but above 0.4400), the decrement is set at 3%. When the oversupply ratio is above 0.6000, which means that the excess supply on the EDC exceeds 60.00% of its maximum, the decrement is set at 3.75%.

If an EDC's tranche target is between 3 tranches and 9 tranches (inclusive), the decrement for that EDC is set as a series of steps. Using this rule, the smallest decrement would be 1.25% (and the amount of the decrease in price would be rounded off to the nearest cent). The smallest decrement would be in effect when the oversupply ratio is at or below a pre-determined value (but above 0). The decrement is never more than 3.75% (subject to rounding off). The largest decrement would be in effect when the oversupply ratio is above that pre-determined maximum value.

The following series of steps will be used:

$$\Delta = \begin{cases} 0.01250 & \text{if } \gamma \leq 0.22 \\ 0.02250 & \text{if } 0.22 < \gamma \leq 0.44 \\ 0.03750 & \text{if } \gamma > 0.44 \end{cases}$$

When the oversupply ratio is at or below a value of 0.2200 (but above 0), the decrement is set at 1.25%. When the oversupply ratio is at or below a value of 0.4400 (but above 0.2200), the decrement is set at 2.25%. When the oversupply ratio is above 0.4400, which means that the excess supply on the EDC exceeds 44.00% of its maximum, the decrement is set at 3.75%.

If an EDC's tranche target is 2 tranches or fewer, the decrement for that EDC is set as a series of steps. Using this rule, the smallest decrement would be 2.25% (and the amount of the decrease in price would be rounded off to the nearest cent). The smallest decrement would be in effect when the oversupply ratio is at or below a pre-determined value (but above 0). The decrement is never more than 3.75% (subject to rounding off). The largest decrement would be in effect when the oversupply ratio is above that pre-determined maximum value.

The following series of steps will be used:

$$\Delta = \begin{cases} 0.0225 & \text{if } \gamma \leq 0.20 \\ 0.0375 & \text{if } \gamma > 0.20 \end{cases}$$

When the oversupply ratio is at or below a value of 0.2000 (but above 0), the decrement is set at 2.25%. When the oversupply ratio is above 0.2000, which means that the excess supply on the EDC exceeds 20.00% of its maximum, the decrement is set at 3.75%.

Change from Regime 2 to 3

In the first round:

- After the going prices for round 4 are calculated; and
- In which the upper bound of the total excess supply range reported to bidders is 20 tranches;

then the decrement formulas of Regime 3 will be used for the going prices in the next round and for the remainder of the Auction.

Regime 3

In Regime 3, the following decrement formulas will be used.

If an EDC's tranche target is 20 tranches or more, the decrement for that EDC is set as a series of steps. Using this rule, the smallest decrement would be 0.25% (and the amount of the decrease in price would be rounded off to the nearest cent). The smallest decrement would be in

effect when the oversupply ratio is at or below a pre-determined value (but above 0). The decrement is never more than 2.5% (subject to rounding off). The largest decrement would be in effect when the oversupply ratio is above that pre-determined maximum value.

The following series of steps will be used:

$$\Delta = \begin{cases} 0.0025 & \text{if } \gamma \leq 0.16 \\ 0.0100 & \text{if } 0.16 < \gamma \leq 0.36 \\ 0.0150 & \text{if } 0.36 < \gamma \leq 0.56 \\ 0.0250 & \text{if } \gamma > 0.56 \end{cases}$$

When the oversupply ratio is at or below a value of 0.1600 (but above 0), the decrement is set at 0.25%. When the oversupply ratio is at or below a value of 0.3600 (but above 0.1600), the decrement is set at 1%. When the oversupply ratio is at or below a value of 0.5600 (but above 0.3600), the decrement is set at 1.5%. When the oversupply ratio is above 0.5600, which means that the excess supply on the EDC exceeds 56.00% of its maximum, the decrement is set at 2.5%.

If an EDC's tranche target is between 10 and 19 tranches (inclusive), the decrement for that EDC is set as a series of steps. Using this rule, the smallest decrement would be 0.25% (and the amount of the decrease in price would be rounded off to the nearest cent). The smallest decrement would be in effect when the oversupply ratio is at or below a pre-determined value (but above 0). The decrement is never more than 2.5% (subject to rounding off). The largest decrement would be in effect when the oversupply ratio is above that pre-determined maximum value.

The following series of steps will be used:

$$\Delta = \begin{cases} 0.0025 & \text{if } \gamma \leq 0.16 \\ 0.0100 & \text{if } 0.16 < \gamma \leq 0.36 \\ 0.0150 & \text{if } 0.36 < \gamma \leq 0.56 \\ 0.0250 & \text{if } \gamma > 0.56 \end{cases}$$

When the oversupply ratio is at or below a value of 0.1600 (but above 0), the decrement is set at 0.25%. When the oversupply ratio is at or below a value of 0.3600 (but above 0.1600), the

decrement is set at 1%. When the oversupply ratio is at or below a value of 0.5600 (but above 0.3600), the decrement is set at 1.5%. When the oversupply ratio is above 0.5600, which means that the excess supply on the EDC exceeds 56.00% of its maximum, the decrement is set at 2.5%.

If an EDC's tranche target is between 3 tranches and 9 tranches (inclusive), the decrement for that EDC is set as a series of steps. Using this rule, the smallest decrement would be 1.00% (and the amount of the decrease in price would be rounded off to the nearest cent). The smallest decrement would be in effect when the oversupply ratio is at or below a pre-determined value (but above 0). The decrement is never more than 2.5% (subject to rounding off). The largest decrement would be in effect when the oversupply ratio is above that pre-determined maximum value.

The following series of steps will be used:

$$\Delta = \begin{cases} 0.010 & \text{if } \gamma \leq 0.27 \\ 0.025 & \text{if } \gamma > 0.27 \end{cases}$$

When the oversupply ratio is at or below a value of 0.2700 (but above 0), the decrement is set at 1%. When the oversupply ratio is above 0.2700, which means that the excess supply on the EDC exceeds 27.00% of its maximum, the decrement is set at 2.5%.

If an EDC's tranche target is 2 tranches or fewer, the decrement for that EDC is set as a series of steps. Using this rule, the smallest decrement would be 1.5% (and the amount of the decrease in price would be rounded off to the nearest cent). The smallest decrement would be in effect when the oversupply ratio is at or below a pre-determined value (but above 0). The decrement is never more than 2.5% (subject to rounding off). The largest decrement would be in effect when the oversupply ratio is above that pre-determined maximum value.

The following series of steps will be used:

$$\Delta = \begin{cases} 0.015 & \text{if } \gamma \leq 0.20 \\ 0.025 & \text{if } \gamma > 0.20 \end{cases}$$

When the oversupply ratio is at or below a value of 0.2000 (but above 0), the decrement is set at 1.5%. When the oversupply ratio is above a maximum value of 0.2000, which means that the excess supply on the EDC exceeds 20.00% of its maximum, the decrement is set at 2.5%.