

Decrement formulas for the BGS-RSCP Auction

January 23, 2018

As noted in Section IX.C.8 of the Final BGS-RSCP Auction Rules (dated December 11, 2017), the formulas that will be used in the BGS-RSCP Auction are released to all bidders no later than three days after bidder registration. These decrement formulas, which depend on the EDC load caps and the number of registered bidders, are provided below.

IX.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:

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

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 for that EDC. 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 or 30 tranches, whichever is larger, and it 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 load cap on the EDC. This is represented by $n \cdot LC - TT$, namely the number of registered bidders (n) times the load cap (LC) minus the tranche target (TT). The estimate of maximum possible excess supply for the EDC used for the decrement rules is \overline{RES} , or the measure based on the number of registered bidders and the load cap $n \cdot LC - TT$, 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 25 tranches or more, then the decrement for that EDC is set as follows:

$$\Delta = \text{Max} [0.005 , \min \{ (0.112500 \gamma - 0.009062) , 0.05 \}]$$

For example if $\gamma = 0.2000$, then $\Delta = 0.01344$, which means that prices are reduced by 1.344% for the next round. Prices will be rounded off to the nearest thousandth of a cent.

Using this rule, the smallest decrement would be 0.5% (and the amount of the price decrease would be rounded off to the nearest thousandth of a cent). When the oversupply ratio is at or below 0.1249 (but above 0), the decrement is set at 0.5%. The decrement is never more than 5% (subject to rounding off). When the oversupply ratio is 0.5250 or greater, which means that the excess supply on the EDC reaches 52.50% of its maximum, the decrement is set at 5%. When the oversupply ratio is between 0.1249 and 0.5250, so that the excess supply on the EDC is between 12.49% and 52.50% of its maximum, the decrement is between 0.5% and 5% according to the rule given above.

If an EDC's tranche target is between 10 and 24 tranches (inclusive), then the decrement for that EDC is set as follows:

$$\Delta = \text{Max} [0.005 , \min \{ (0.109375 \gamma - 0.002383) , 0.05 \}]$$

For example if $\gamma = 0.2000$, then $\Delta = 0.01949$, which means that prices are reduced by 1.949% for the next round. Prices will be rounded off to the nearest thousandth of a cent.

Using this rule, the smallest decrement would be 0.5% (and the amount of the price decrease would be rounded off to the nearest thousandth of a cent). When the oversupply ratio is at or below 0.0675 (but above 0), the decrement is set at 0.5%. The decrement is never more than 5% (subject to rounding off). When the oversupply ratio is 0.4790 or greater, which means that the excess supply on the EDC reaches 47.90% of its maximum, the decrement is set at 5%. When the oversupply ratio is between 0.0675 and 0.4790, so that the excess supply on the EDC is between 6.75% and 47.90% of its maximum, the decrement is between 0.5% and 5% according to the rule given above.

If an EDC's tranche target is between 5 and 9 tranches (inclusive), then the decrement for that EDC is set as follows:

$$\Delta = \text{Max} [0.0125 , \min \{ (0.150000 \gamma + 0.001250) , 0.05 \}]$$

For example if $\gamma = 0.1724$, then $\Delta = 0.02711$, which means that prices are reduced by 2.711% for the next round. Prices will be rounded off to the nearest thousandth of a cent.

Using this rule, the smallest decrement would be 1.25% (and the amount of the price decrease would be rounded off to the nearest thousandth of a cent). When the oversupply ratio is at or below 0.0750 (but above 0), the decrement is set at 1.25%. The decrement is never more than 5% (subject to rounding off). When the oversupply ratio is 0.3250 or greater, which means that the excess supply on the EDC reaches 32.50% of its maximum, the decrement is set at 5%. When the oversupply ratio is between 0.0750 and 0.3250, so that the excess supply on the EDC is between 7.50% and 32.50% of its maximum, the decrement is between 1.25% and 5% according to the rule given above.

If an EDC's tranche target is 4 tranches or fewer, the decrement for that EDC is set as a series of steps. Using this rule, the smallest decrement would be 3.00% (and the amount of the price decrease would be rounded off to the nearest thousandth of a 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:

$$\Delta = \begin{cases} 0.03 & \text{if } \gamma \leq 0.10 \\ 0.05 & \text{if } \gamma > 0.10 \end{cases}$$

When the oversupply ratio is at or below a value of 0.1000 (but above 0), the decrement is set at 3.00%. When the oversupply ratio is above 0.1000, which means that the excess supply on the EDC exceeds 10.00% 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 30 tranches; and
- At least 15 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 15 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 30 or fewer 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 25 tranches or more, then the decrement for that EDC is set as follows:

$$\Delta = \text{Max} [0.00375 , \min \{ (0.085000 \gamma - 0.007125) , 0.0375 \}]$$

For example if $\gamma = 0.2000$, then $\Delta = 0.00988$, which means that prices are reduced by 0.988% for the next round. Prices will be rounded off to the nearest thousandth of a cent.

Using this rule, the smallest decrement would be 0.375% (and the amount of the price decrease would be rounded off to the nearest thousandth of a cent). When the oversupply ratio is at or below 0.1279 (but above 0), the decrement is set at 0.375%. The decrement is never more than 3.75% (subject to rounding off). When the oversupply ratio is 0.5250 or greater, which means that the excess supply on the EDC reaches 52.50% of its maximum, the decrement is set at 3.75%. When the oversupply ratio is between 0.1279 and 0.5250, so that the excess supply on the EDC is between 12.79% and 52.50% of its maximum, the decrement is between 0.375% and 3.75% according to the rule given above.

If an EDC's tranche target is between 10 and 24 tranches (inclusive), then the decrement for that EDC is set as follows:

$$\Delta = \text{Max} [0.00375 , \min \{ (0.082031 \gamma - 0.001787) , 0.0375 \}]$$

For example if $\gamma = 0.2000$, then $\Delta = 0.01462$, which means that prices are reduced by 1.462% for the next round. Prices will be rounded off to the nearest thousandth of a cent.

Using this rule, the smallest decrement would be 0.375% (and the amount of the price decrease would be rounded off to the nearest thousandth of a cent). When the oversupply ratio is at or below 0.0675 (but above 0), the decrement is set at 0.375%. The decrement is never more than 3.75% (subject to rounding off). When the oversupply ratio is 0.4790 or greater, which means that the excess supply on the EDC reaches 47.90% of its maximum, the decrement is set at 3.75%. When the oversupply ratio is between 0.0675 and 0.4790, so that the excess supply on the EDC is between 6.75% and 47.90% of its maximum, the decrement is between 0.375% and 3.75% according to the rule given above.

If an EDC's tranche target is between 5 and 9 tranches (inclusive), then the decrement for that EDC is set as follows:

$$\Delta = \text{Max} [0.009375 , \min \{ (0.112500 \gamma + 0.000938) , 0.0375 \}]$$

For example if $\gamma = 0.2069$, then $\Delta = 0.02421$, which means that prices are reduced by 2.421% for the next round. Prices will be rounded off to the nearest thousandth of a cent.

Using this rule, the smallest decrement would be 0.9375% (and the amount of the price decrease would be rounded off to the nearest thousandth of a cent). When the oversupply ratio is at or below 0.0749 (but above 0), the decrement is set at 0.9375%. The decrement is never more than 3.75% (subject to rounding off). When the oversupply ratio is 0.3250 or greater, which means that the excess supply on the EDC reaches 32.50% of its maximum, the decrement is set at 3.75%. When the oversupply ratio is between 0.0749 and 0.3250, so that the excess supply on the EDC is between 7.49% and 32.50% of its maximum, the decrement is between 0.9375% and 3.75% according to the rule given above.

If an EDC's tranche target is 4 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

price decrease would be rounded off to the nearest thousandth of a 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:

$$\Delta = \begin{cases} 0.0225 & \text{if } \gamma \leq 0.10 \\ 0.0375 & \text{if } \gamma > 0.10 \end{cases}$$

When the oversupply ratio is at or below a value of 0.1000 (but above 0), the decrement is set at 2.25%. When the oversupply ratio is above 0.1000, which means that the excess supply on the EDC exceeds 10.00% 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 30 or fewer 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 25 tranches or more, then the decrement for that EDC is set as follows:

$$\Delta = \text{Max} [0.0025 , \min \{ (0.045000 \gamma - 0.000875) , 0.025 \}]$$

For example if $\gamma = 0.2000$, then $\Delta = 0.00813$, which means that prices are reduced by 0.813% for the next round. Prices will be rounded off to the nearest thousandth of a cent.

Using this rule, the smallest decrement would be 0.25% (and the amount of the price decrease would be rounded off to the nearest thousandth of a cent). When the oversupply ratio is at or below 0.0750 (but above 0), the decrement is set at 0.25%. The decrement is never more than 2.5% (subject to rounding off). When the oversupply ratio is 0.5750 or greater, which means that the excess supply on the EDC reaches 57.50% of its maximum, the decrement is set at 2.5%. When the oversupply ratio is between 0.0750 and 0.5750, so that the excess supply on the EDC is between 7.50% and 57.50% of its maximum, the decrement is between 0.25% and 2.5% according to the rule given above.

If an EDC's tranche target is between 10 and 24 tranches (inclusive), then the decrement for that EDC is set as follows:

$$\Delta = \text{Max} [0.0025 , \min \{ (0.054687 \gamma - 0.001191) , 0.025 \}]$$

For example if $\gamma = 0.2000$, then $\Delta = 0.00975$, which means that prices are reduced by 0.975% for the next round. Prices will be rounded off to the nearest thousandth of a cent.

Using this rule, the smallest decrement would be 0.25% (and the amount of the price decrease would be rounded off to the nearest thousandth of a cent). When the oversupply ratio is at or below 0.0675 (but above 0), the decrement is set at 0.25%. The decrement is never more than 2.5% (subject to rounding off). When the oversupply ratio is 0.4790 or greater, which means that the excess supply on the EDC reaches 47.90% of its maximum, the decrement is set at 2.5%. When the oversupply ratio is between 0.0675 and 0.4790 so that the excess supply on the EDC is between 6.75% and 47.90% of its maximum, the decrement is between 0.25% and 2.5% according to the rule given above.

If an EDC's tranche target is between 5 and 9 tranches (inclusive), then the decrement for that EDC is set as follows:

$$\Delta = \text{Max} [0.0075 , \min \{ (0.070000 \gamma + 0.002250) , 0.025 \}]$$

For example if $\gamma = 0.1724$, then $\Delta = 0.01432$, which means that prices are reduced by 1.432% for the next round. Prices will be rounded off to the nearest thousandth of a cent.

Using this rule, the smallest decrement would be 0.75% (and the amount of the price decrease would be rounded off to the nearest thousandth of a cent). When the oversupply ratio is at or below 0.0750 (but above 0), the decrement is set at 0.75%. The decrement is never more than 2.5% (subject to rounding off). When the oversupply ratio is 0.3250 or greater, which means that the excess supply on the EDC reaches 32.50% of its maximum, the decrement is set at 2.5%. When the oversupply ratio is between 0.0750 and 0.3250, so that the excess supply on the EDC is between 7.50% and 32.50% of its maximum, the decrement is between 0.75% and 2.5% according to the rule given above.

If an EDC's tranche target is 4 tranches or fewer, the decrement for that EDC is set as a series of steps.

Using this rule, the smallest decrement would be 1.50% (and the amount of the decrease in price would be rounded off to the nearest thousandth of a 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 value.

The following series of steps will be used:

$$\Delta = \begin{cases} 0.015 & \text{if } \gamma \leq 0.10 \\ 0.025 & \text{if } \gamma > 0.10 \end{cases}$$

When the oversupply ratio is at or below a value of 0.1000 (but above 0), the decrement is set at 1.50%. When the oversupply ratio is above 0.1000, which means that the excess supply on the EDC exceeds 10.00% of its maximum, the decrement is set at 2.5%.