9–18 KELER CCP's Announcement

Balancing Clearing and Trading Platform
guarantee system

Effective from: 26 February 2024

According to KELER CCP Ltd.'s General Business Rules, KELER CCP Ltd. approved the Balancing Clearing and Trading Platform's (TP) margin requirements for its Clearing Members as listed below.

Balancing Clearing Turnover Margin Calculation for system users not acting as TSOs on the Hungarian gas market

Turnover margin basis

Balancing Clearing turnover margin is based on three core components, and the maximum of these will be the turnover margin basis. The first component is calculated with the application of the coherent risk metric, Expected Shortfall. This will likely to be the turnover margin basis, when there were significant imbalances of the Clearing Member in the lookback period. The second component is a floor based on the internal risk assessment of the Clearing Member, and the size of Member's average EXIT portfolios (offtakes). The last component is a minimum component, the fixed floor. The following formula explains the turnover margin basis, or $KSZFmargin$.

$$KSZFmargin_i = max(ES_i, \, RF_i, FF), \text{ where}$$

- $KSZFmargin_i$: Turnover margin basis for settlement day i
- ES_i: Expected Shortfall component for settlement day i
- RF_i: Ratio Floor component for settlement day i
- FF: Fixed Floor component, which has a constant value

Expected Shortfall component (ES)

Expected Shortfall is a risk metric that takes the average of losses higher than the VaR for the same period.

$$ES(x, \, \alpha) = E[x|x > VaR(x, \alpha)], \text{ where}$$

- x: Variable for which the calculation is prepared, usually losses
- α: Confidence level, 99%
- $VaR(x, \alpha)$: The loss assigned the αth percentile of the loss distribution. If L_p is the loss assigned to the p-th percentile then $VaR(x, 99\%) = L_{99}$
- $E[x|x > VaR(x, \alpha)]$: Expected value of the values of x knowing they are higher than $VaR(x, \alpha)$

In our calculation the underlying variable is not loss but a ratio of aggregated exposure and average aggregated EXIT.

$$aggregated\ exposure_i = \sum_{t=1}^{n} daily\ imbalance\ position\ (EUR)_t, \text{ where}$$

- $aggregated\ exposure_i$: From KELER CCP's perspective, this is the potential, total exposure upon default of the Clearing Member calculated on settlement day i cumulated backwards
- i: The settlement day of calculation
- t: It denotes gas day, $t = 1$ is the gas day before the calculation day

- n: Counting backwards, the number of gas days until and including the second settlement day from the calculation day
- *Time period between* $t = 1$ *and* n: Usually it is either a 2-day or a 4-day period. For example, if the calculation is run on Wednesday, the timeframe consists of Monday and Tuesday. If the calculation is run on Monday, the timeframe consists of Thursday, Friday, Saturday and Sunday. In case of holidays, the timeframe used for exposure calculation might be ever longer.
- *daily imbalance position* $(EUR)_t$: The difference between the ENTRY (MWh) and EXIT (MWh) amounts determined by the TSO for each gas day. The difference is converted to EUR with either the marginal purchase price or marginal sell price depending on the direction. In case the EXIT is higher than the ENTRY for a gas day, then the marginal purchase price is applied. This is considered positive difference (EXIT-ENTRY). The resulting imbalance positions are also increased by the VAT if the Clearing Member is required to pay VAT in Hungary. Due to the aggregation process daily positive and negative imbalance positions can offset each other.

To exclude potential distortion of the proportional exposure compared to EXIT, we apply aggregated EXIT as well. This way significantly volatile EXIT portfolios will not necessarily result in higher turnover margin requirement.

$$aggregated\ EXIT_i = \sum_{t=1}^{n} daily\ EXIT\ portfolio\ (EUR)_t, \text{ where}$$

- $aggregated\ EXIT_i$: Daily EXIT portfolios determined by the TSO are summed for the *Time period between* $t = 1$ *and* n.
- i: The settlement day of calculation
- t: It denotes gas day, $t = 1$ is the gas day before the calculation day
- n: Counting backwards, the number of gas days until and including the second settlement day from the calculation day
- *Time period between* $t = 1$ *and* n: Usually it is either 2-day or a 4-day period. For example, if the calculation is run on Wednesday, the timeframe consists of Monday and Tuesday. If the calculation is run on Monday, the timeframe consists of Thursday, Friday, Saturday and Sunday. In holiday periods, the timeframe used for exposure calculation might be ever longer.
- *daily EXIT portfolio* $(EUR)_t$: TSO determines the total EXIT for each gas day in MWh and it is converted to EUR with the marginal purchase price.

To further adjust the denominator for its volatility, KELER CCP added an average calculation for smoothing effect. From the long average (250 settlement day) and the short average (10 settlement day), the higher is taken as the final average, which then fed into the Expected Shortfall calculation.

$$average\ aggregated\ EXIT_i = max \left(\frac{1}{n} \sum_{i=1}^{250} aggregated\ EXIT_i \ ; \frac{1}{m} \sum_{i=1}^{10} aggregated\ EXIT_i \right), \text{ where}$$

- n: The number of settlement days in the 250 settlement day lookback period when the EXIT was higher than zero
- m: The number of settlement days in the 10 settlement day lookback period when the EXIT was higher than zero

- i: It denotes settlement days, $i = 1$ denotes the current settlement day (calculation day).

The underlying variable (x_i) to the Expected Shortfall can now be calculated for each day in the 250 settlement day lookback period.

$$x_i = \frac{aggregated\ exposure_i}{average\ aggregated\ EXIT_i}$$

Then the Expected Shortfall is calculated as follows:

$$ES(\%)_i = \frac{1}{k}\sum_{i=1}^{250} max[x_i; VaR(x_i; \alpha)], \text{ where}$$

- k: The number of settlement days in the lookback period when $x_i > VaR(x_i; \alpha)$
- α: Confidence level, 99%

$$ES_i = ES(\%)_i * average\ aggregated\ EXIT_i$$

In case of a new Clearing Member, right after receiving the Clearing right, the value of Expected Shortfall cannot be computed. For the first 3 settlement days after receiving the Clearing right, there is a simpler calculation for this component.

$$ES_i = ES(\%)_i * simple\ average\ daily\ EXIT_i, \text{ where}$$

- ES_i: In case of new Clearing Members, it is a simplified component and not based on the risk metric Expected Shortfall
- $ES(\%)_i$: The maximum of $\frac{daily\ imbalance\ position\ (EUR)_t}{daily\ EXIT\ portfolio\ (EUR)_t}$ for all the gas days since receiving the Clearing right
- $simple\ average\ daily\ EXIT_i$: Simple average of $daily\ EXIT\ portfolio\ (EUR)_t$ for all the gas days since receiving the Clearing right (not identical what is used in case of Ratio Floor)

Ratio Floor (RS)

The Ratio Floor was designed to capture the risk of potential imbalance exposures caused by Clearing Members who have not had any imbalances in the past. These potential future exposures cannot be incorporated in the Expected Shortfall component. The Ratio Floor is based on the average size of the EXIT portfolio, the creditworthiness of the Clearing Member and the size of Clearing Member compared to its average EXIT. To calculate this component two variables are necessary, the ratio (R) and the $average\ daily\ EXIT_i$.

The ratio (R) is a percentage parameter that is unique for each Clearing Member. It is recaulcated quarterly and sent to the Clearing Members via e-mal. The ratio (R), among other information, utilizes the result of the internal risk assessment of the Clearing Member. Its minimum is 5% and the maximum is either 45% or 60%. The maximum depends on whether the Clearing Member is considered an existing or a new Member. After receiving the Clearing Right, the Clearing Member is

considered new[1] until the second, orderly review of the ratio (R) (minimum 3 months, maximum 6 months).

The $average\ daily\ EXIT_i$ is similar to the $average\ aggregated\ EXIT_i$, however both the average calculation and the underlying values differ. In this case we do not apply aggregation, but use only the simple, daily EXITs.

$$average\ daily\ EXIT_i =$$

$$max\left(\frac{1}{j}\sum_{t=1}^{15} daily\ EXIT\ portfolio\ (EUR)_t\ ; \sum_{t=1}^{365} \omega_t * daily\ EXIT\ portfolio\ (EUR)_t\right), where$$

- j: The number of gas days in the 15 gas day lookback period when the EXIT was higher than zero
- t: It denotes gas day, $t = 1$ is the gas day before the calculation day
- ω_t: The weight calculated[2] for gas day t and $\sum_{t=1}^{365} \omega_t = 1$

Fixed Floor (FF)

The Fixed Floor is currently set to 50.000 EUR.

Applied buffers

KELER CCP applies two buffers on top of $KSZFmargin$. The first buffer is the expert buffer and the second is the procyclicality buffer.

$$MINmargin_i = KSZFmargin_i * (1 + \theta_i), where$$

- θ_i: The expert buffer (%) which is effective from settlement (calculation) day i. It is based on iterative backtesting and reviewed on a daily basis. It is published on KELER CCP's website.

$$PROmargin_i = max[MINmargin_i * (1 + \pi_i); PROmargin_{i-1} * (1 - \tau)], where$$

- $PROmargin_i$: This is the buffered turnover margin basis on settlement day i except if it would result in a higher than acceptable decrease in margin requirement
- $PROmargin_{i-1}$: $PROmargin$'s value for the previous settlement day
- π_i: The procyclicality buffer which is effective from settlement (calculation) day i. It is published on KELER CCP's website.
- τ: The maximum decrease of turnover margin. Its current value is **20%** meaning the value of $PROmargin_i$ cannot be lower than the 80% of the $PROmargin_{i-1}$

KELER CCP applies rounding rules to get the final turnover margin requirement.

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[1] This is different from the New Clearing Membership in case of Expected Shortfall

[2] $\omega_t = \frac{(1-\lambda)*\lambda^{t-1}}{1-\lambda^{365}}$, where $\lambda = 0,9875$ and $t = 1$ is the gas day before calculation day

$$margin_i = \begin{cases} PROmargin_i \,, \ if \ only \ I. \ condition \ is \ met \\ \left\lceil \frac{PROmargin_i}{\gamma} \right\rceil * \gamma \,, \ if \ II. \ or \ III. \ condition \ is \ met \\ \left\lceil \frac{PROmargin_i}{\gamma} \right\rceil * \gamma + \gamma \,, \ if \ neither \ condition \ is \ met \end{cases}$$

- γ: The scale of rounding, its current value is 10.000 EUR
- $\lceil \; \rceil$:The value inside these brackets are rounded up to the nearest integer
- $I. \, condition$: The value of $PROmargin_i$ is below the *rounding minimum*, which has a value of 100.000 EUR.
- $II. \, condition$: After a decrease to a lower rounding category, $PROmargin_i$ has been lower than the nearest 10.000 EUR at least by the *rounding threshold*, which has a value of 3.000 EUR, for 5 consecutive settlement days
- $III. \, condition$: The margin increases

Balancing Clearing Turnover Margin Calculation for system users acting as TSOs on the Hungarian gas market

Due to the special characteristics of the operation of a TSO, there is a different methodology for turnover margin calculation for such Clearing Members. Only TSOs acting as TSOs in Hungary will have this methodology applied. A TSO for a different area joining the Hungarian gas market will have the methodology explained above.

Turnover margin basis

Both components of the turnover margin basis are calculated with the application of the coherent risk metric, Expected Shortfall.

$$KSZFmargin_i = \left\lceil \frac{max(SES_i, LES_i)}{\gamma} \right\rceil * \gamma, \text{ where}$$

- $KSZFmargin_i$: Turnover margin basis for settlement day i
- $\lceil \; \rceil$:The value inside these brackets are rounded up to the nearest integer
- SES_i: Short Expected Shortfall component for settlement day i
- LES_i: Long Expected Shortfall component for settlement day i
- γ: The scale of rounding, its current value is 500.000 EUR

Short Expected Shortfall component (SES)

$$SES_i = \frac{1}{k}\sum_{t=1}^{n} max\left[daily \ imbalance \ position \ (EUR)_{t,pos}; VaR\left(daily \ imbalance \ position \ (EUR)_{t,pos}; \alpha\right)\right],$$
$$where$$

- k: The number of gas days in the lookback period of n when
  $daily \ imbalance \ position \ (EUR)_{t,pos} > VaR\left(daily \ imbalance \ position \ (EUR)_{t,pos}; \alpha\right)$
- t: It denotes gas day, $t = 1$ is the gas day before the calculation day
- n: The number of gas days in the 365 gas day lookback period when

$daily\ imbalance\ position\ (EUR)_t > 0$
- α: Confidence level, 99%
- $daily\ imbalance\ position\ (EUR)_t$: The difference between the ENTRY (MWh) and EXIT (MWh) amounts of other non-TSO system users, determined by the TSO, summed up for each gas day. Before summing the positions, the imbalances (MWh) are converted to EUR with either the marginal purchase price or marginal sell price depending on the direction. In case the EXIT is higher than the ENTRY for a gas day, then the marginal purchase price is applied. This is considered negative difference in case of a TSO (ENTRY-EXIT). The resulting imbalance position is also increased by the VAT if the TSO is required to pay VAT in Hungary.
- $daily\ imbalance\ position\ (EUR)_{t,pos}$: It equals to $daily\ imbalance\ position\ (EUR)_t$ when the TSO would have had a net financial obligation due to other system users' imbalances. Therefore this excludes all negative results.

Long Expected Shortfall component (LES)

$$LES_i = \frac{1}{k}\sum_{t=1}^{n} max\left[daily\ imbalance\ position\ (EUR)_{t,pos}; VaR\left(daily\ imbalance\ position\ (EUR)_{t,pos}; \alpha\right)\right],$$

- n: This is a continuously changing parameter. The number of gas days since 2010.07.01 when $daily\ imbalance\ position\ (EUR)_t > 0$
- The rest of the variables are the same for SES_i and LES_i

Applied buffers

KELER CCP only applies the expert buffer in case of the TSO. The final turnover margin requirement then calculated as follows:

$$margin_i = KSZFmargin_i * (1 + \theta_i), \text{ where}$$

- θ_i: The expert buffer which is effective from settlement (calculation) day i. It is based on iterative backtesting and reviewed on a daily basis. It is published on KELER CCP's website.

Trading Platform Turnover Margin Calculation

- There is no algorithm based turnover margin requirement calculation by KELER CCP for Trading Platform market. Clearing Members can voluntarily define the amount of turnover margin necessary for their trading limits.

- Clearing Members can define the necessary amount of collaterals (EUR) as turnover margin based on their planned exposures and trading limits.

- If Clearing Members do not generate any financial obligations, the placement of turnover margin is not necessary; meaning the required minimum amount of turnover margin is 0 EUR for Trading Platform Clearing Members.

Intraday margin calls

1) Balancing Exposure Margin

In accordance with Section 8.10.2. of the General Business Rules, KELER CCP is entitled to initiate intraday margin call towards the Gas Market Clearing Members. KELER CCP determines the payment obligation in respect of the Balancing Clearing on every business day at 1pm CET. Should the resulting payment obligation be higher than collaterals provided in respect of Balancing Clearing (turnover margin, additional financial collateral, basic financial collateral and default fund contribution), KELER CCP orders an intraday margin call for the affected Gas Market Clearing Member in order to cover the difference. The margin call results in an automatic debit transaction in the respective amount on the settlement account. The margin call shall be covered within two (2) hours following the notification sent via email.

2) Intraday margin call due to turnover margin increase

In accordance with Section 8.10.2. of the General Business Rules, KELER CCP is entitled to initiate intraday margin call towards the Gas Market Clearing Members. KELER CCP determines the turnover margin requirement in respect of the Balancing Clearing on every business day at 1pm CET. Intraday margin call related to turnover margin increase can only be ordered on business days when the following calendar day is a non-business day (e.g. weekend, holiday). Should the calculated turnover margin requirement be higher than the latest calculated, KELER CCP orders an intraday margin call for the affected Gas Market Clearing Member in order to cover the difference. The margin call results in an automatic debit transaction in the respective amount on the settlement account. The margin call shall be covered within two (2) hours following the notification sent via email.

Position limit for Trading Platform

The positon limit is the actual amount of blocked collaterals for KELER CCP as beneficiary, adjusted with financial positions.

$$Position\ limit = \frac{B}{1 + VAT} + T + \min(Tp; 0) + \min(Sp; 0)$$

where,

- B: Value of collateral assets (placed for Trading Platform).

- VAT: The current value of value-added tax. In this calculation, the value of VAT is 0% for foreign Clearing Members.

- T: Cumulated financial position based on the transactions which are not yet cleared on Trading Platform in the current clearing cycle (value is positive in case of net seller, negative in case of net buyer).

- Tp: Cumulated financial position based on the transactions which are not yet cleared on Trading Platform in the previous clearing cycle (value is positive in case of net seller, negative in case of net buyer).

- Sp: Net financial position based on the transactions which have been already cleared but not yet settled on Trading Platform (value is positive in case of net seller, negative in case of net buyer).

Other provisions

KELER CCP has the right to amend this Announcement with immediate effect and publishes the amended Announcement on its website.

Budapest, 7 February 2024

KELER CCP Ltd.