Nasdaq

Further information regarding Member Default – Q&A no 2 – 2018-09-19

We refer to the recent default event in Nasdaq Commodities market notified under Default Notice no 39/18 in relation to which Nasdaq Clearing has compiled the following questions and answers ("Q&A") for members of Nasdaq Clearing. This Q&A should be read in conjunction with the previously issued market notices describing the default.

Introductory note, the information contained in these Q&A is:

- intended for Nasdaq Clearing members only;
- intended for general guidance only; and
- is not represented to be complete. In relation to this Nasdaq Clearing is required to operate within the scope of applicable laws and regulatory requirements, which include adherence to contractual obligations, confidentiality and other restrictions on disclosure of information as apply to it. In compliance with this, Nasdaq Clearing has answered the questions below exercising its best efforts at short notice, disclosing the limited information below.

This document contains a number of Q&A, structured according to the below

1. Previously communicated Q&A on the default (published on Friday 14 September, 2018)
2. The Market
3. The Risk Management Model of Nasdaq Clearing
4. Actions related to risk model and waterfall
5. Size of position and limits
6. Replenishment process
7. Close-out process
8. Outcome of close-out process

1. Previously communicated Q&A on the default (published on Friday 14 September, 2018)

Q1 Describe the events that triggered the default process

- On Monday September 10, 2018, the markets in Nordic and German power experienced an extreme movement in the spread.
- The defaulted portfolio contained a large spread position between Nordic and German Power that was negatively impacted by the fluctuation in the spread between the Nordic and German power markets.
- An Intraday Margin Call (IDMC) was issued to the Relevant Clearing Member on Monday September 10, 2018.
- The margin payment obligation triggered by the IDMC was not met in full by the Relevant Clearing Member, which triggered initial default procedures.

Q2 Did the margin system react immediately?

- The margin system did react immediately and an IDMC was issued to the Relevant Clearing Member.

Q3 Did the Relevant Clearing Member meet Initial Margin (IM) requirements in the week of 3 – 7 September, 2018?

- In the week of 3-7 September 2018, the spreads in the Nordic and German power markets did increase gradually but did not display any abnormal volatility.
- The Relevant Clearing Member met all IM calls during the week leading up to the default. Accordingly, no IDMC calls were issued to the Relevant Clearing Member during the week of 3-7 September 2018.

Q4 How large was the defaulting portfolio, expressed as a percentage of total Initial Margin?

- The defaulted portfolio represented less than 5% of the total Initial Margin pool for the Commodity Clearing Service.

Q5 Describe the close-out process for the Relevant Clearing Member's defaulted portfolio.

- The Relevant Clearing Member was declared to be in default on Tuesday September 11 at 8.20 am.
- Nasdaq Clearing's default management procedures are built on closing out positions in the market, in combination with working with pre-assigned close-out providers.
- Nasdaq has "close-out provider" agreements with 6 Clearing Members in the Commodities market, based on the level of activity in the market.
- In this situation, the Default Committee made an assessment of the most appropriate process for closing out the Relevant Clearing Member's position, this included (but was not limited to):
    - an assessment of which members were likely to be able to bid on a significant part of this position;
    - how to minimise losses in the Relevant Clearing Member's defaulted portfolio by holding a closed auction in order to avoid creating extreme market movements and having to close-out in more volatile market conditions.
- Four members were invited to bid in the closed auction.
- The Nasdaq Commodities market consists of 166 members.

Q6 Where are we now in the process?

- Replenishment notices were issued in accordance with the Default Fund Rules during Thursday September 13, 2018.
- The replenishment is required to be met by Monday September 17, 2018.

Q7 Has Nasdaq Clearing replenished its part of the default fund?

- Yes.
- In addition, Nasdaq Clearing is implementing a temporary Junior Capital for the Commodity Market of 200 million SEK (approx. 19 million euro).
- This temporary Junior Capital will be added in addition to existing capital in the clearing default waterfall and will be funded by Nasdaq Clearing. This means that the temporary Junior Capital would be utilized first, before the remaining funds in the existing Commodity Default Fund. Please also note that replenished member funds would be the last tranche to be utilized during the interim period.
- The temporary Junior Capital will remain in place during an interim period of 90 days starting today.

Q8 Have any changes been made to Nasdaq's margin levels as a result of the default?

- In order to reduce the risk profile in the market situation following the default, Nasdaq Clearing has decided to increase margin levels.
- Confidence levels have been increased in order to shift risk of a particular portfolio from the default fund to the owner of the portfolio.
- We have increased margins on spread positions.

Q9 Will Nasdaq Clearing pursue recovery of funds from the Relevant Clearing Member in relation to that member's defaulted portfolio?

- Nasdaq is taking all reasonable steps to recover funds from the Relevant Clearing Member.
- Any funds recovered will be apportioned in accordance with the Default Fund Rules.

Background – German/Nordic spread data

Data below is based on price movements of the next-in-delivery yearly power contract (currently 2019), as it is illustrative to describe the similar movements in power contracts covering different time periods.

- The market on Monday September 10 experienced an extreme movement in the spread
- The spread widened to a level not observed since the Swedish power market was segmented into four zones in 2011
- Prior to Monday September 10, the largest daily change in spread since 2011 was 1.6 EUR.
- 99% of all observations during this period were below 1 EUR.
- Nasdaq Clearing's margin model for this particular spread was calibrated to cover changes in margin spread up to approximately 4 EUR.
- Observed changes in spread during the days leading up to the default
    - 3 Sept: + 0.93 EUR
    - 4 Sept: + 0.40 EUR
    - 5 Sept: + 0.52 EUR
    - 6 Sept: + 0.33 EUR
    - 7 Sept: + 0.47 EUR
    - 10 Sept: + 5.56 EUR
- On Monday September 10, the spread increased by 17 times compared to a normal day's change.

2. The Market

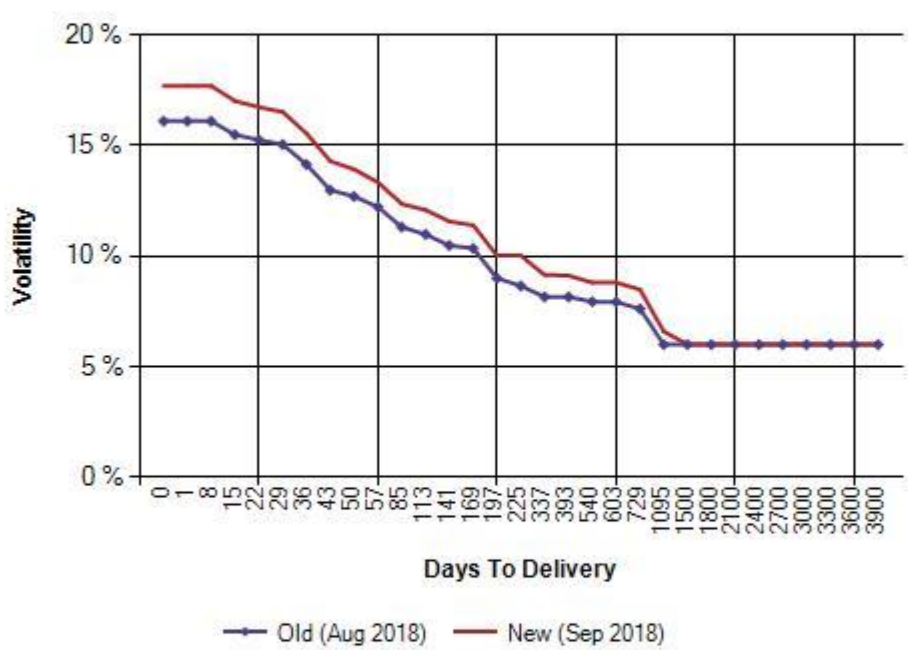
- **How have the markets performed in the days following the default?**
  - The Nasdaq Commodities marketplace has been open and operating as usual throughout the period in question.

  - Nordic Power volumes
    - Average Daily Volume (ADV)
      - September 13-15: 6.3 TWh Cleared of which 2.7 TWh Traded on Exchange
      - First 11 days of September 2018: 5.4 TWh Cleared of which 2.5 TWh Traded on Exchange
      - First 11 days of September 2017: 5.2 TWh Cleared whereof 2.2 TWh Traded on Exchange

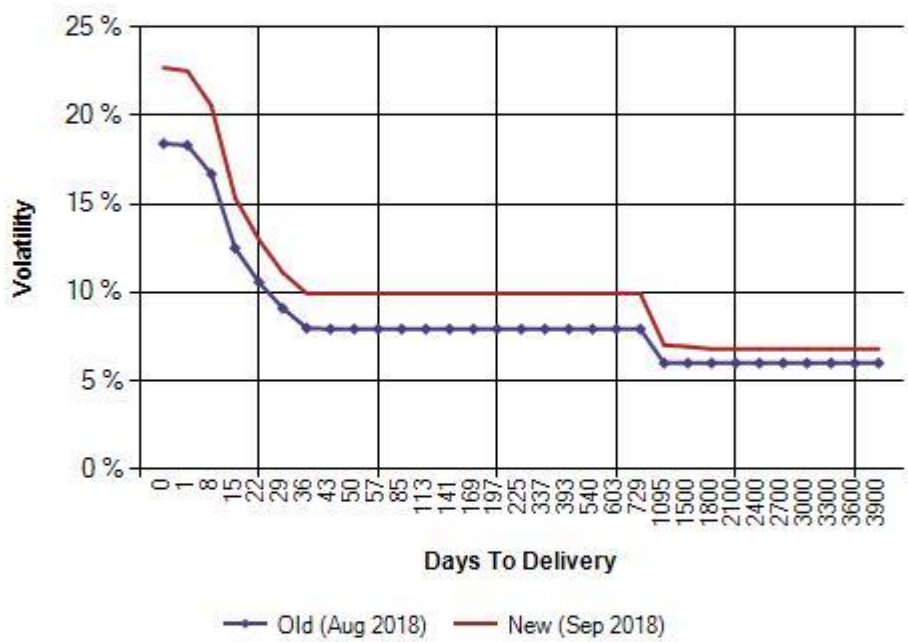
  - German Power volumes
    - Average Daily Volume (ADV)
      - September 13-15: 0.939 TWh Cleared
      - First 11 days of September 2018: 0.542 TWh Cleared
      - First 11 days of September 2017: 0.857 TWh Cleared

3. The Risk Management Model of Nasdaq Clearing

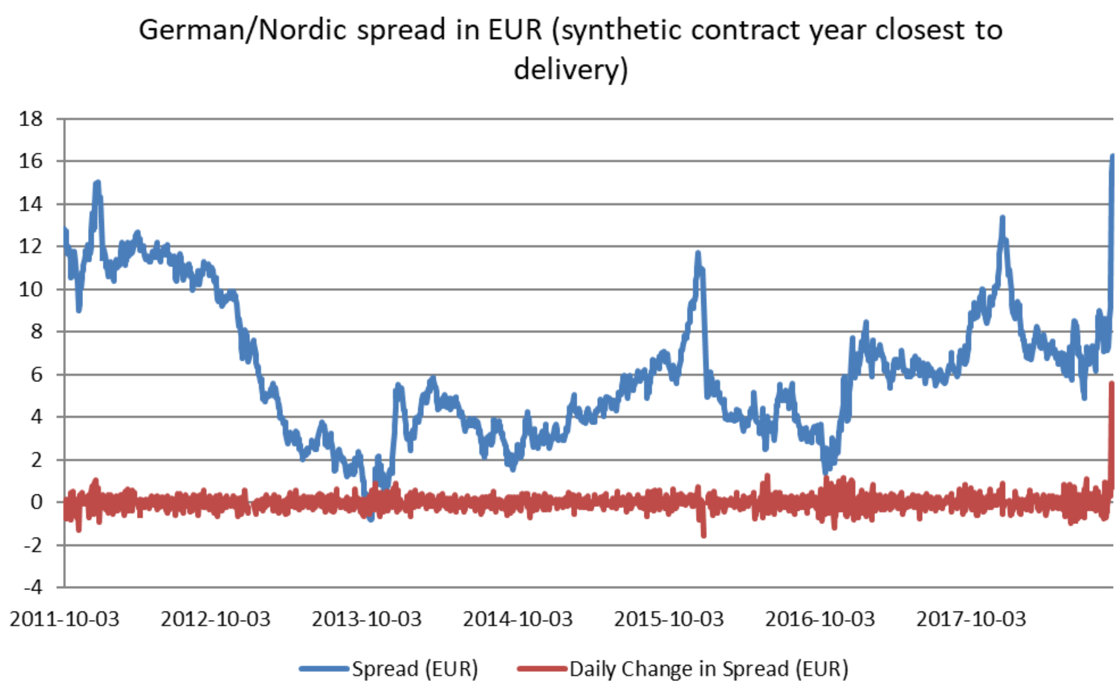
- **What were the margin levels applied to the products in question over the days leading up to the default?**
  - Nordic power curve:



- German power curve:



- **What are the historical spread changes in the relevant products?**
  - It is important to point out that the relevant measure for the clearing house is the extreme change in the spread rather than the size of the spread.



- **What was the size of the Junior Capital and how was its size determined?**
    - Article 16 of EMIR includes requirements on the amount of capital that the CCP shall hold. EMIR also includes requirements on the amount of capital that the CCP shall have available in the "waterfall" (including the default fund). In accordance with these rules, the CCP shall contribute 25% of the Article 16 capital as "skin-in-the-game" in the waterfall. This corresponds to SEK 129 million for Nasdaq Clearing.
    - The total amount of capital set aside in the waterfall by Nasdaq Clearing amounts to SEK 145 million, i.e. SEK 16 million in addition to the regulatory requirement. This amount is allocated across the different clearing services, i.e. across the various asset classes.
    - SEK 70 million (of the SEK 145 million) was allocated as Junior Capital to the Commodities waterfall.
    - The Senior Capital is fixed to MSEK 200. The amount is calibrated to create an incentive for Nasdaq Clearing to minimize the risk for utilization of the Mutualized Default Fund.

- **What is the structure of the Nasdaq Clearing waterfall?**

    - EMIR Requirements
        - Under Art. 45 of the European Market Infrastructure Regulations EMIR, a CCP is required to utilise a default waterfall to cover losses caused by a defaulting member. This has been implemented under Section 7 of the Default Fund Rules (Clearing Appendix 9 to the Clearing Rules issued by Nasdaq Clearing AB) (the "Clearing Rules").

    - CCP Rules

        - A description of the default waterfall is provided below. Please be advised that this description assumes no split of the Default Loss sustained as the relevant defaulting losses relate to Commodity Instruments only. Unless otherwise defined here, capitalised terms used below have the meaning given to them in the Clearing Rules.
        - Please also see below an illustration of the waterfall of pre-funded capital resources, pre and post the current.

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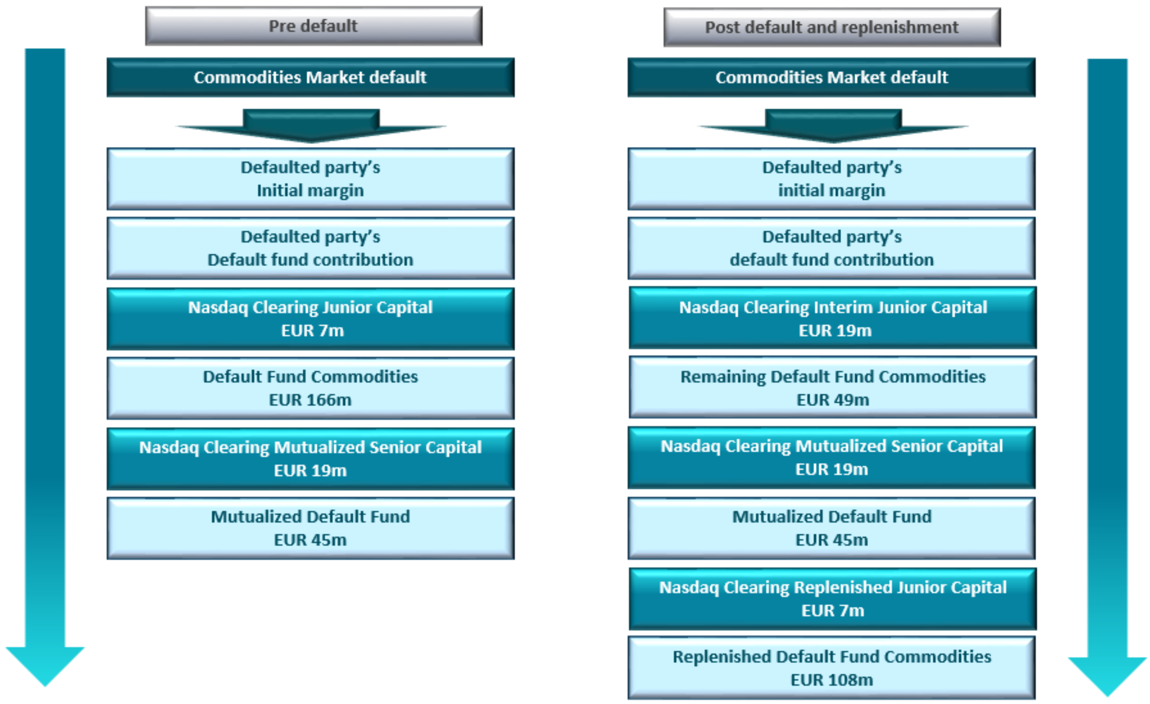

- In the event of a Default Loss, the Default Fund, the Junior Capital and the Senior Capital are designated to cover such a Default Loss in the order of priority below (note this is a summary, the full rule is as set out in section 7):

    1. All Contributed Assets of the Default Fund Participant (whether or not in excess of the Fund Requirement);
    2. Junior Capital (provided that Junior Capital allocated to cover Default Losses for Commodity Instruments are only applied to cover such Default Losses);
    3. Contributions by each non-defaulting Default Fund Participant to the Commodity Default Fund, applied on a pro rata basis relative to the aggregate contributions made by all non-defaulting Default Fund Participants to the Commodity Default Fund;
    4. Senior Capital – this is prima facie allocated to each of the three Default Funds (i.e. Commodity Instruments, Seafood Instruments and Financial Instruments) on a pro rata basis and will be applied on the basis of that allocation, but amounts not utilised for Default Losses in respect of one Default Fund can be utilised for the others until it is fully utilised;
    5. Contributions made by each non-defaulting Default Fund Participant to the Mutual Default Fund – this is utilised in the same manner as Senior Capital;
    6. The guarantee commitment given by each Default Fund Participant in respect of Excess Losses (required under the Default Fund Rules regarding Guarantee Commitments);
    7. Where any remaining Default Losses occur in connection with a default under an Interim Period, any capital replenished via new contributions in Eligible Funds by each non-defaulting Fund Participant is applied to cover such Default Losses in the same order that follows from (2) to (5).

4. Actions related to risk model and waterfall

Please refer to Q8 in the Q&A published on Friday 14 September, 2018.

- **What is the effect of the temporary Junior Capital implemented by Nasdaq Clearing?**
  - Nasdaq Clearing has implemented a change in the Clearing Rules to introduce a new tier of capital in the Default Fund waterfall known as the temporary Junior Capital of 200 million SEK (approx. 19 million euro).
  - This temporary Junior Capital has been added in addition to existing capital in the clearing default waterfall and will be funded by Nasdaq Clearing. This means that the temporary Junior Capital would be utilized first, before the remaining funds in the existing Commodity Default Fund. Please also note that replenished member funds would be the last tranche to be utilized during the interim period.
  - The temporary Junior Capital will remain in place during an interim period of 90 days starting September 14.

- **How is Nasdaq Clearing responding in order to minimize the risk of similar events in the future?**
  - Nasdaq Clearing has taken a number of immediate actions as described in this document. These actions are mainly aimed at adjusting the margin levels and adding funds to the waterfall. Additional actions may be taken at a later stage, depending on the outcome of the in-depth analysis of the default event and the default process.
  - In addition to the actions outlined above, we are engaging a third party to support in our validation of our margin models and risk processes.

5. Size of position and limits

- **What was the size and composition of the defaulting portfolio?**
  - In respect of the defaulter´s portfolio, please refer to the introductory note above.

- **What percentage of open interest in the relevant contracts was held by the defaulting party?**
  - In respect of the defaulter´s portfolio, please refer to the introductory note above.

- **Were there any pre-trade controls in place for the defaulting party?**
  - Clearing Members are subject to the Trading Rules which also bind them to the Trading Procedures. The Trading Procedures state inter alia that the Exchange will reject orders that exceed the maximum allowed notional value or volume, as determined by the Exchange from time to time (Section 8) and that the Exchange may reject or cancel any order which contravenes the Trading Rules or applicable law (Section 5.6).
  - The Trading Procedures are available in appendix 4 of the Trading Rules, http://www.nasdaqomx.com/digitalAssets/106/106872_171120-trading-appendix-4---trading-procedures--clean-.pdf.

- **Were any MiFID II position limits exceeded?**
    - The Norwegian FSA has set position limits for the relevant products, in accordance with MiFID II. The Norwegian FSA has confirmed, in a press release of September 14, that the position limits were not breached by the Relevant Clearing Member at the time of the default declaration.

- **Were there any margin concentration limits in place?**
    - The policy is available on Nasdaq Clearing's website, https://business.nasdaq.com/media/Margin-Concentration-and-Position-Limit-Policy_2018-08-20_tcm5044-30733.pdf

6. Replenishment process

- **Have all clearing members replenished their share of the default fund?**
    - All members had replenished their share of the default fund by Monday September 17.

- **Will Nasdaq Clearing pursue recovery of funds from the Relevant Clearing Member in relation to that member's defaulted portfolio?**
    - Nasdaq is taking all reasonable steps to recover funds from the Relevant Clearing Member.
    - Any funds recovered will be apportioned in accordance with the Default Fund Rules, i.e. be applied towards the default fund participants on a pro rata basis and once the default fund participants have recovered their entire replenished amount be applied towards Nasdaq Clearing´s Junior Capital.

7. Close-out process

- **What is the mandate of the Nasdaq Clearing Default Committee?**
    - The Nasdaq Clearing Default Committee is the single decision-making authority within Nasdaq Clearing for evaluating default situations and events and deciding which—if any—actions will be taken as permitted under its Rules and Regulations as well as any applicable legal agreements.
    - The Default Committee has the mandate to act in every possible way to reduce the risk in the portfolio. This means that Default Committee is authorized by the Boards to choose whatever solution adequate to reduce or eliminate the risk exposure.
    - Nasdaq Clearing's default management process is set out in accordance with Article 48 of EMIR and the Nasdaq Clearing Rulebook, and the Instruction for the Default Committee of Nasdaq Clearing.
    - EMIR Requirements
        - Under Article 48(1) of EMIR, a CCP shall have detailed procedures in place to be followed where a clearing member does not comply with the participation requirements of the CCP laid down in Article 37 within the time limit and in accordance with the procedures established by the CCP. The CCP shall set out in detail the procedures to be followed in the event the default

of a clearing member is not declared by the CCP. Those procedures shall be reviewed annually.

  - Article 48(2) of EMIR further provides that a CCP shall take prompt action to contain losses and liquidity pressures resulting from defaults and shall ensure that the closing out of any clearing member's positions does not disrupt its operations or expose the non-defaulting clearing members to losses they cannot anticipate or control.

- CCP Rules
  - Section 8.2.5 of the Clearing Rules (in respect of a Material Default Event), any transactions undertaken by the CCP on the account and risk of the defaulter may take place through such means as the CCP deems appropriate under the circumstances, provided that the CCP uses reasonable endeavours to obtain the best price possible at the relevant time.

  - Under Nasdaq Clearing AB's Default Strategy for Commodity Derivatives, the CCP may choose to close out a defaulting member's portfolio through a closed auction, attempting to unwind the entire portfolio to one participant or divide the portfolio between two or more participants. The process is reliant on members contributing prices on close-out volumes. One or several members may participate in an auction and the portfolio is allocated based on the best bid and ask quotes or the best bid for the entire portfolio.

    The Default Strategy for Commodity Derivatives is available on Nasdaq Clearing's website, https://business.nasdaq.com/media/Default-Strategy-Commodity-Derivatives_tcm5044-30710.pdf.

- **What was the timeline of events?**
  - Monday September 10, 2018
    - An Intraday Margin Call (IDMC) was issued to the Relevant Clearing Member.
    - The IDMC was not met in full, which triggered initial default procedures.
  - Tuesday September 11, 2018
    - The Relevant Clearing Member was declared to be in default at 8.20 am.
  - Wednesday September 12, 2018
    - The defaulting portfolio was closed out and the risk has been fully contained.
  - Thursday September 13, 2018
    - Replenishment notices were issued in accordance with the Default Fund Rules.
  - Friday September 14, 2018
    - Nasdaq Clearing contributed EUR 20 million as temporary Junior Capital.
  - Monday September 17, 2018
    - The Default Fund recapitalized by 100%, or EUR 107 million.

- **Why was it decided to hold a closed auction and why were not all market participants asked to bid on the defaulted portfolio?**
  - Please refer to Q5 in the Q&A published on Friday 14 September, 2018.
  - In respect of any further details, please refer to the introductory note above.

8. Outcome of close-out process

- **What was the loss of the Relevant Clearing Member's portfolio inclusive of initial margin and what was the result of the auction?**
  - In respect of the details of the portfolio and the result of the auction, please refer to the introductory note above.

- **What is the methodology for distributing the loss between clearing members?**
  - According to the rules Nasdaq Clearing, the total loss is to be distributed among the Commodities default fund participants per the last communicated Default Fund contribution calculation active as of 2018-09-03.
  - In this particular case, each participant was called upon to replenish an amount equal to approximately 68.2% of their previous default fund contribution.
  - The losses were allocated in accordance with the default fund waterfall as set out in the Default Fund Rules.